To Replace Aging SRAM A

SRAM II Missile System Will Be Safer, More Accurate, More Flexible, with Greater Range

A new warhead being developed by Sandia for a short-range air-to-ground missile system will significantly increase strategic bomber effectiveness and will replace the aging W69/SRAM A system developed in the 1960s.

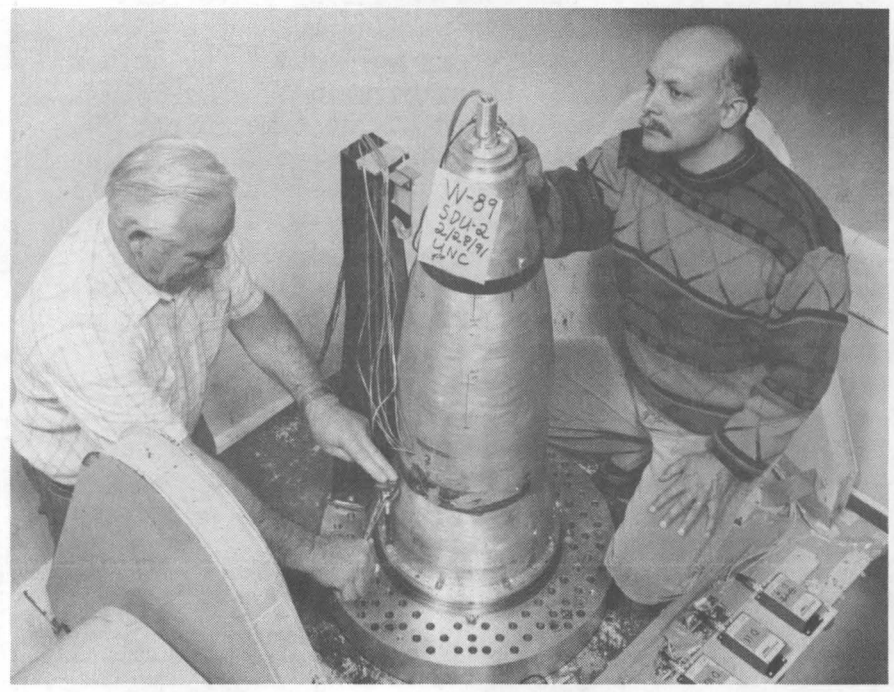
Called the Short Range Attack Missile II, or SRAM II, the system will be equipped with a new warhead — the W89. (The warhead also can be made compatible with the older SRAM A missile.)

In addition to greater range, SRAM II has better "over-the-shoulder," or backward firing, capability than the SRAM A and is designed to be more accurate. Although the missile is launched forward from the aircraft, it can bank, roll, and maneuver to follow any necessary trajectory, including turning around to attack a target behind the aircraft.

"What the SRAM does is give the Air Force more flexibility in attacking targets."

Last June, development of the SRAM II entered Phase 4, the Production Engineering phase, in which DOE begins to procure materials and fabricate components for the system. Full-scale production is scheduled to begin in January 1994.

The W89/SRAM II system is being developed jointly by the Air Force, Lawrence Livermore National Laboratory (LLNL), Sandia, and Boeing Aerospace and Electronics Co., and will become part of a suite of bomber weapons now available to the Air Force. Boeing is the designer of the SRAM II missile, which can be launched from either a B-1B or B2 strategic bomber. The weapon will be capable of attacking hardened missile silos and other strategic targets.



ROGER SMITH (left, contractor) and Don Lind (8156) prepare to test a nose cone on a W89 warhead at Sandia, Livermore.

"What the SRAM does is give the Air Force more flexibility in attacking targets," says Jim Wright, Manager of Systems Development Dept. 8150.

In all, about 300 people at Sandia are involved in the W89/SRAM II project, notes Jim.

Sandians designed the firing set, the neutron generator, the programmer, the gas transfer system, the structural components, the permissive action link (PAL), and the stronglinks (safety components that help prevent accidental detonation), he adds. The PAL is a sophisticated, cryptographic use-control system with recode capability, and was designed by Command and Control Subsystems Div. 2331, and Command and Control Divisions 5126 and 5127. Component Development Div. 8446 is designing the gas transfer system.

Production responsibility lies with several DOE production facilities, including Allied Signal,

(Continued on Page Four)

LAB NEWS

VOL. 43, NO. 13 SANDIA NATIONAL LABORATORIES JUNE 28, 1991

Sandia Honors Reservists Returned From Gulf War — See Page Five

NMSU STUDENT Andrew Engelmann (right) shows a special bike brake mechanism to Hugh Bivens. Andrew and another mechanical engineering student at NMSU designed the special brake and installed it on a 21-speed mountain bike, which was presented to Hugh May 17.

Researchers 'Loaned' to NMSU

Aggie Students Build Special Bike Brake for Son of Sandian

Biking has always been one of 19-year-old Hugh Bivens' favorite activities. Until four weeks ago, however, he hadn't ridden a bicycle in nine years. At the age of 10, severe juvenile rheumatoid arthritis in Hugh's hands and limbs made it impossible for him to grip bicycle hand brakes.

Hugh, son of Sandian Hugh Bivens (2534), was determined to ride again. Three years ago, a doctor in Seattle suggested that Hugh find a multigear road bike with coaster brakes, which young Hugh believed he could ride without difficulty. They searched for one, but to their disappointment they found only an ordinary three-speed with coaster brakes. No multigear bike existed that used coaster brakes (a coaster brake would interfere with the gear systems on most bikes). Young Hugh wanted more gears.

No multigear bike existed that used coaster brakes. Young Hugh wanted more gears.

Then Ruben Urenda (2542), a mechanical design instructor at UNM and co-worker of Hugh's father, had another idea. He believed that undergraduate engineering students could design a special brake mechanism for Hugh as part of a class project.

Ruben spoke to O'Neill Burchett (7551), a Sandian on a two-year assignment with NMSU's Mechanical Engineering Department in Las Cruces. O'Neill agreed to take on the project as part of his senior design course in mechanical engineering.

Designing and Delivering

O'Neill is one of three Sandians assigned to NMSU under a new program to foster a better research relationship with New Mexico universities. He assigned the bicycle project to his engineering students last fall. "The students really enjoyed working on something that had practical applications," says O'Neill.

During the first semester of the two-semester course, students designed two versions of a hand brake mechanism — both compatible with a 21-speed mountain bike — that required less force to operate than normal hand brakes. By the end of the fall semester, however, it was clear that both designs still required too much force for Hugh. If he was to use the brakes, they would have to be leg-operated.

(Continued on Page Nine)

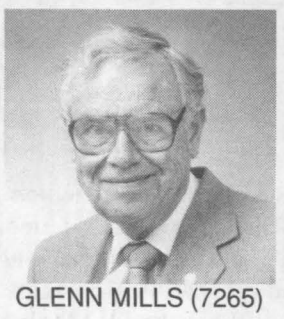
This & That

A Hairy Story – Many long-time Sandians have heard the story, but others haven't. Gus Simmons (Org. 200) has sported a long beard for years. (A photo of Gus and a story about him receiving an honorary doctorate are on page eight). Gus tells the story well about why he has kept the beard for so many years. Here's a short version.

More than 20 years ago, Gus – clean-shaven at the time – left Sandia for another job. He rejoined the Labs several years later, right after growing the beard on a mountain climbing trip. Gus was soon called on to brief various DOE and other visitors. When he appeared in Sandia President John Hornbeck's office for a briefing one day, John (now deceased) looked at Gus and bluntly said, "That's the ugliest damn thing I've ever seen." Gus wasn't sure whether John, a man of strong opinions, was serious or just pulling his string, so he laughed it off. But Gus found out soon at another briefing that John didn't like that beard one bit and was trying to goad him into cutting it off. Gus explains, "This time, the President glared at me and asked me in front of the visitors, 'What are you – a Mennonite or something?' I just replied, 'Something,' and made up my mind on the spot that there was *no way* I was going to cut off the beard."

* * *

I'm Feeling a Little Sick, Myself! – In the past two issues, we've featured two Sandians – Bill Walker (7267) and Gene Emerson (3223) – who haven't taken a day of sick leave in more than 35 years. Now we hear from Glenn Mills (7265), who retires July 5 and who can't recall taking any sick leave during his 38-year Sandia career.



GLENN MILLS (7265)

* * *

Sandia Name Games – Those helpful folks in Personnel Information Systems Div. 3532 often provide the LAB NEWS and other organizations with all kinds of statistical analyses of the "Sandia family." Several weeks ago, Rod Geer (3163) was scheduling the Post Tiger Team Town Meetings and needed the Sandia, Albuquerque personnel roll analyzed by the first letters of our last names.

Kevin McMahon (3532) provided the list, and just for the heck of it, I analyzed his analysis. As of May 16, more Albuquerque-based Sandians' last names begin with S than with any other letter: 812 folks or 10.7 percent of us. In second place is M: 711 folks, 9.3 percent. No Sandian has a last name beginning with X, so the "U people" bring up the rear with 23 folks, 0.3 percent. Although E is the most commonly used letter in the English language, only 144 of us, 1.9 percent, have last names beginning with that letter.

* * *

By Accident or Design? – Former LAB NEWS editor Bruce Hawkinson (Org. 5) submits the following for Sandia's "most fortuitous phone number": The last four digits in Bob Workhoven's office number are 3433. Bob supervises Divison 3433.

* * *

Please Tell Me – Tell me that I'm not the only one who does this. Most busy people write themselves reminder notes from time to time, but for the second time in recent memory, I wrote a note to myself and then signed it!

•LP

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Published Fortnightly on Fridays

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Recent Patents

James "Red" Jones, Ben Petterson (both 1416), and David Strip (1412): Methods of and System for Swing Damping Movement of Suspended Objects.

Don Sharp (1841), Milton Vernon (6464), and Steve Wright (6462): Process for Forming a Metal Compound Coating on a Substrate.

Bruce Bunker (1842), Diana Lamppa, and Jim Voigt (both 1846): Method for the Preparation of Thallium-Containing Superconducting Materials by Precipitation.

Wendy Cieslak (2523) and Lenny Storz (6345): Separator Material for Electrochemical Cells.

Terry Guilinger, Joel Stevenson (both 1841), Howland Jones (1821), Mike Kelly (1824), John Medernach (2131), and Sylvia Tsao (former Sandian): Electrochemical Method for Defect Delineation in Silicon-on-Insulator Wafers.

Richard Curlee (7471), Randy Watkins (6611), and Clint Tuthill (former Sandian): Method of Bonding Single Crystal Quartz by Field-Assisted Bonding.

Richard Brow (1845) and Randy Watkins (6611): High Expansion, Lithium Corrosion Resistant Sealing Glasses.

Achievements Include China Tour

Priddy Named Fellow of ASME

Sandian Tom Priddy (400), now on special assignment at DOE Headquarters in Washington, D.C., has been named a Fellow of the American Society of Mechanical Engineers (ASME).

The position of Fellow is conferred upon members with at least 10 years of active experience in engineering who have made significant contributions in their fields. Fewer than 2 percent of the ASME's 127,000 members are Fellows.

During his Sandia career, which began in 1961, Tom supervised both the Applied Mechanics and the Vibration Test divisions. In 1985, he was a member of an ASME technology exchange committee that spent three weeks traveling and lecturing in the People's Republic of China.

As a Member of the Technical Staff, Tom performed engineering analyses in support of nuclear weapons design and testing, and developed analytical techniques for predicting the dynamic response of composite materials in complex heat shields and reentry vehicles.

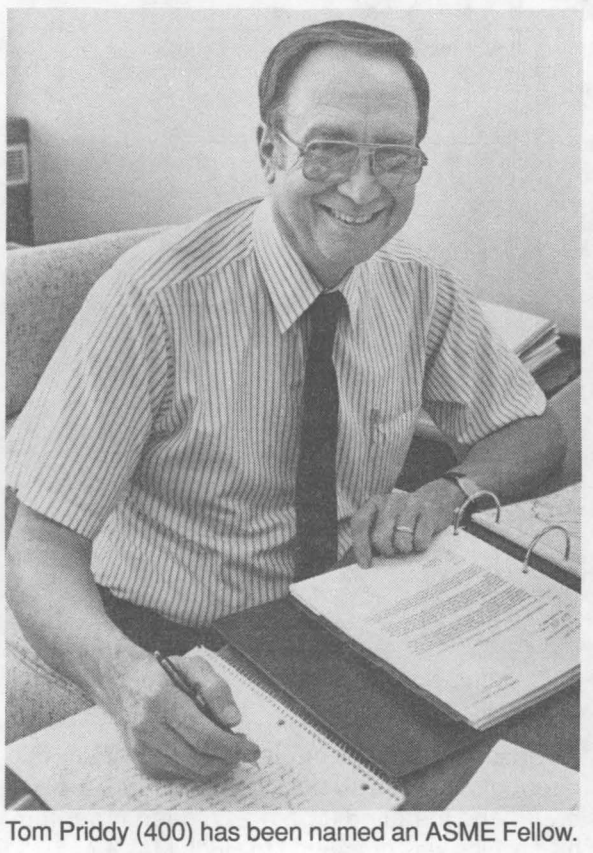
As Supervisor of Applied Mechanics, he oversaw and contributed to the structural development of nuclear weapons, development of accident-resistant containers, analysis of transportation accident environments, development of Sandia's Pressure Safety Manual, containment of high explosives, analysis of soil-structure response of penetrating projectiles, and the study of creep closure of oil storage caverns.

As head of the Vibration Test Division, Tom supervised experiments in dynamic testing and contributed to new technologies in force identification, high-frequency vibration testing, combined acoustics and vibration, and combined centrifuge and vibration testing.

For the past nine years, he has served on ASME's High-Pressure Systems Committee, which has been writing a national standard for high-pressure system safety. Tom is past chairman of the New Mexico section of ASME and chaired the local section's 13th Annual Symposium.

His other achievements include technical consulting to NASA and serving on the performance review committee for Members of Technical Staff. He has authored many engineering publications, including several on high-pressure equipment and safety, and has taught mechanical engineering at three Texas universities.

Tom holds one patent for an inflatable aircraft wing that can be unfolded and inflated with compressed gas. Two others are being pursued by DOE for design improvements to systems used in vibration testing. •



Tom Priddy (400) has been named an ASME Fellow.

Feeling Stress?

Counseling Services Now Available Onsite at Livermore

Employees in Livermore now have counseling services available onsite three days a week. Psychologist Dr. Robert Allen and Marriage and Family Counselor Barbara Regan (both 8527) began office hours early this month in Bldg. 911.

The two say they will develop a stress reduction and biofeedback program for onsite employees, as well as organize a series of summer speakers who will address stress reduction and other mental health topics during lunchtime (Bldg. 904 auditorium).

Robert's specialty is clinical psychology, and he will also help handle the Personnel Assurance Program (a certification program for explosives handlers) with Jeff Manchester (8527).

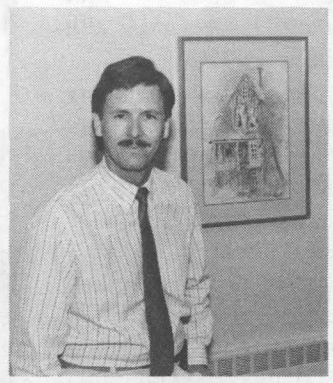
BARBARA REGAN (8527), one of two onsite counselors available to Livermore employees, specializes in marriage and family counseling.

Barbara specializes in marriage and family counseling but welcomes individuals who need counseling about other matters. The two have researched the East Bay area including Alameda, Contra Costa, and San Joaquin counties — interviewing therapists so they can provide employees with referrals when more extensive counseling sessions are required.

Tuesdays, Wednesdays, and Thursdays

Robert will be onsite from 8 a.m. to 4 p.m. each Tuesday; Barbara will be available from 9 a.m. to 1 p.m. Wednesdays and Thursdays. They can be reached by calling 294-2200 during non-office hours. Appointments can be made by calling Medical Div. 8527 on 294-2700.

Robert earned a BS at DePauw University, an MS in psychology at the University of Ottawa (Canada), and a PhD in psychology from the California School of Professional Psychology. He completed an undergraduate internship at the Santa Clara Valley Medical Center and trained two years postdoctorally at Stanford Medical Center.



CLINICAL PSYCHOLOGIST Robert Allen (8527) says he and Barbara Regan (8527) will develop a stress reduction and biofeedback program for onsite employees.

He runs a private practice in San Jose. His professional memberships include the American and California Psychological Associations, American Association for the Study of Headache, and the National Academy of Neuropsychologists. He is on the board of directors for the Santa Clara County Psychological Association and is Hospital Practices chairman for the association. He and his wife live in Los Gatos.

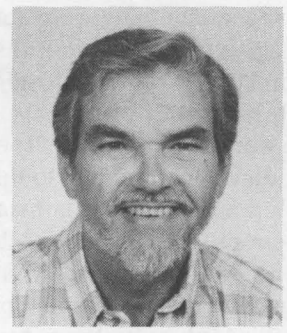
Barbara attended DeAnza College and received a BA in psychology from the University of California at Santa Barbara. She earned her master's degree in counseling from San Francisco State University.

Her memberships include the California Association of Marriage and Family Therapists and the Biofeedback Society of California. She is certified by the Biofeedback Certification Institute of America. She and her husband have two children and live in Los Gatos. Her practice is in San Jose. •BLS

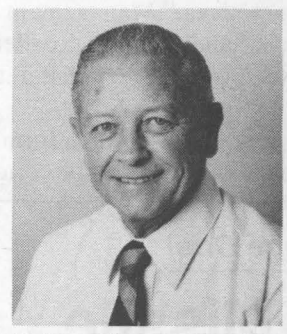
Take Note

Mark Mintz (8481) captured a trophy and six blue ribbons for his entries in the Pleasanton Rose Show last month. He won the Best Rose of English Origin trophy for his deep red Olympiad variety rose. He has raised roses as a hobby for eight years in Pleasanton.

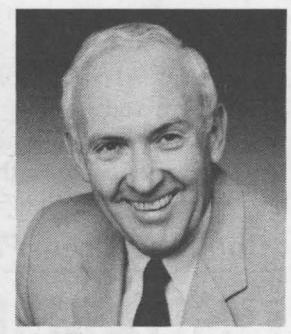
Recent Retirees



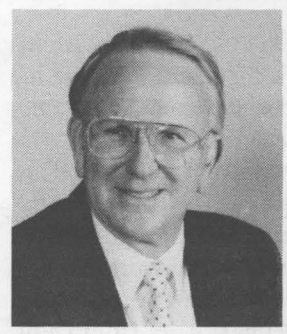
Don Veca (8512) 25



Bobby Allen (8161) 32



David Dean (8166) 32



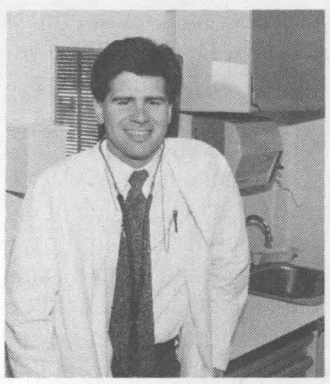
Herman "Rudy" Johnson (8316) 34

Jerry Priebat (8274) 25

Supervisory Appointment

DR. SAM WALTERS joins Sandia as Supervisor of Medical Div. 8527.

A native of Kansas City, Mo., Sam earned a BS in biology at the University of Missouri. He later received his MD from the University of Missouri and spent a 2-1/2 year residency at the University of Kansas, where he trained in general surgery and family practice.



DR. SAM WALTERS (8527)

He then joined AT&T in Kansas City as staff physician, first at the Kansas City Works, then in the corporate offices. He also worked as Medical Director for the North Carolina Works (in Winston-Salem, N.C.) and the Richmond, Va., Works (AT&T production sites) before accepting his current position. While in Kansas City he did volunteer work at the Westport Free Health Clinic.

Sam is currently working on a master's degree in occupational medicine at the University of Michigan, which he expects to complete in August. He enjoys running, cycling, and swimming, and lives in Oakland.

SANDIA LIVERMORE NEWS

CONTINUING his contribution to science education in Livermore schools, Carl Melius (center, 8353) presents the 1991 Carl Melius Science Award to Mary Ann Miller, social studies and computer science teacher at Junction Avenue School. On the right are Bob Carling (8300A) from the Science Advisory Council and Eva Long, Livermore Schools deputy superintendent. At left are Junction principal Sheila Cooper and Judy Hazen, a past award recipient and nominator of this year's winner. The other winner (not pictured) is Marie Ruzicki, teacher at Portola School. Carl began the awards program four years ago by donating his DMTS award to the school district to help finance innovative science programs.

Tiger Team Report Says Sandia Could Serve as DOE Model

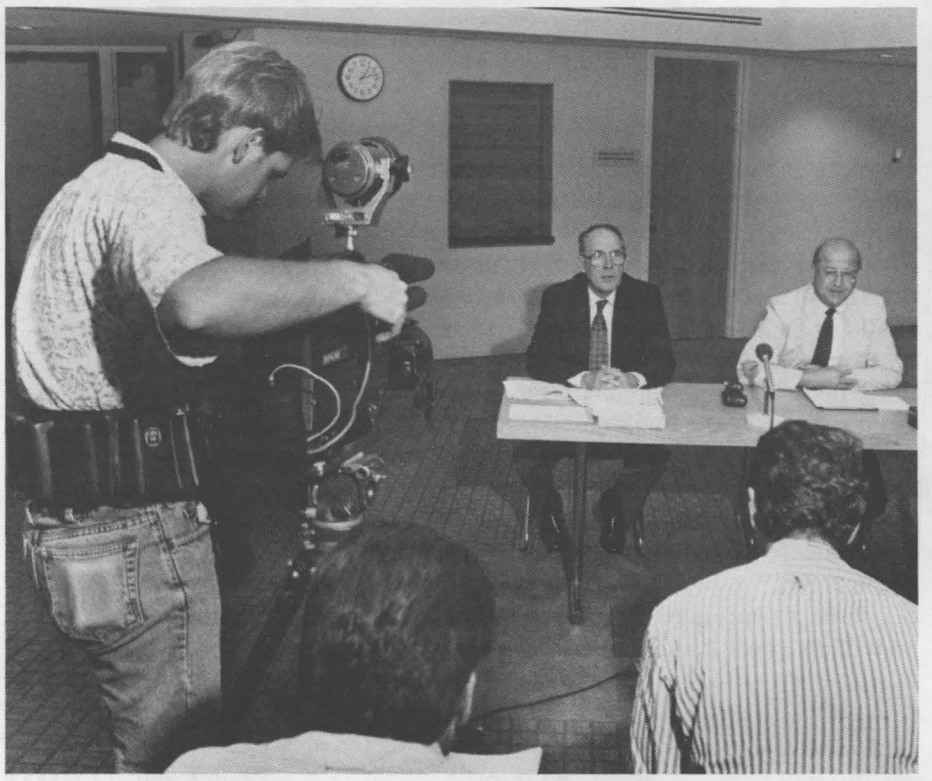
The Department of Energy issued its report on the Tiger Team's assessment of environment, safety, and health programs at Sandia, Albuquerque, on June 24, and the press release accompanying the report commended the Labs for implementing a "new safety culture." Tiger Team leader Dave Spence said that "if Sandia, Albuquerque carries through with its environment, safety, and health initiatives, it could well serve as a model Department of Energy Lab."

The release noted, however, that there were deficiencies in all of the safety and health technical areas reviewed at the Labs. These deficiencies were attributed to a lack of formal policy that would adequately delegate safety and health program responsibilities to lower levels of management, leading to inconsistent supervision of workplace practices. The release also noted that none of the safety and health findings pose a threat to the general public.

The Tiger Team praised Sandia for "a substantial effort to develop and implement a self-assessment program at SNL, Albuquerque prior to the Tiger Team's arrival on site." In all, in the safety and health area there were 242 individual findings, one under Category I (clear and present danger), seven under Category II (significant risk or substantial non-compliance with DOE orders), and 234 under Category III (non-compliance findings that are not considered urgent). Environmental findings totaled 82, 71 in the area of compliance and 11 under "best management practices." Management findings totaled 18.

DOE's Al Chernoff says Sandia did an excellent job in its self-assessment, discovering 70 percent of the problems detailed in the Tiger Team report before the team arrived.

DOE/Sandia has until July 26 to submit a formal action plan to DOE Headquarters to explain how the deficiencies will be corrected.



ES&H Vice President Glen Cheney (seated, left) and Al Chernoff, Manager of DOE's Kirtland Area Office, respond to reporters' questions at a June 24 news conference announcing findings of the Tiger Team during its visit to Sandia, Albuquerque in April and May. See next issue of the LAB NEWS for details.

(Continued from Page One)

SRAM II Missile

Rocky Flats, General Electric, Mound, Savannah River, and Pantex.

"The key to our success to date is the willingness of all involved to work together to resolve the issues and problems that arise in the course of a development program like the W89," says Jim.

"Examples include teaming with LLNL to implement current nuclear safety philosophy, working with the production complex to resolve ES&H and producibility issues, and working with Boeing and the Air Force to find solutions to interface problems. Two supervisors from Dept. 8150 — Mim John and Russ Miller — participated in an Air Force independent review of the missile program."

Modern Safety Features

The W89 warhead incorporates several modern nuclear safety features, such as a magnetic stronglink (Single Stronglink Assembly) in the firing set — first applied on the W88 — and Detonator Safing Stronglinks (DSSL) in the nuclear explosive package.

"This first implementation of the DSSL was made possible by the exemplary working relationship between Sandia and Mound," says Jim.

The nuclear explosive package also has a fire resistant pit and Insensitive High Explosive (IHE) designed by Lawrence Livermore National Laboratory. Such safety features make the warhead less sensitive to high-velocity impact or fire and minimize the risk of scattering special nuclear materials in case of an accident.

Two important design reviews of the weapon system, including a safety review, were completed in 1990. Although weapon safety has always been a primary concern at Sandia, the W89 is the first warhead to fully incorporate Pentagon S controls for nuclear safety critical design documents and drawings, notes Doug Gehmlich (8155). These regulations are more formal than in the past, and further ensure that the design is not changed without first considering the nuclear safety implications.

The system has already undergone a variety of rigorous ground tests and captive flight tests, in preparation for live flight tests planned for June 1992. Future tests will include dropping the package from an extreme height, slamming it into a wall on a rocket sled track, subjecting it to a rocket motor plume, engulfing it in jet fuel flames, and zapping it with lightning.

Last summer, a B-1B aircraft subjected the system to in-flight vibrations and ejection tests at White Sands Missile Range in New Mexico and at Edwards Air Force Base and the Pacific Missile Test Center in California. Hydrodynamic tests

The system has already undergone a variety of rigorous ground tests and captive flight tests.

were conducted at LLNL, and nuclear tests have been conducted at the Nevada Test Site.

The system has also survived electromagnetic fields and pulses. "That's sort of like putting it in a microwave and trying to cook it," notes Ed Cull, Supervisor of W89/SRAM II Mechanical Systems Div. 8154, whose group is responsible for the structural design.

Most of the tests of the weapon system are conducted in Albuquerque, including electromagnetic tests, fire tests, sled tests, lightning tests, and centrifuge and drop tests. In all, some 140 system-level tests will be conducted, notes Jim.

Testing has been overseen by Mim John, formerly Supervisor of W89/SRAM II Test & Evaluation Div. 8156, who was recently promoted to Manager of Systems Analysis Dept. 8110. Carolyn Pura now supervises the test division.

FASTENING BOLTS on a W89 test model is Tim Buteau (contractor).

Although the W89 development program is managed by Sandians at Livermore, many people working on the project are in Albuquerque. Engineers in both Albuquerque and Livermore are responsible for developing the various components for the warhead, says Russ Miller, Supervisor of W89/SRAM II Electrical Systems Div. 8155.

"We design the overall system, author the control drawings, and provide them to Component Development Organization 2000 in Albuquerque," notes Russ. "We order the parts and are responsible for confirming their function as the system design evolves."

Besides working with Lawrence Livermore, Sandia also cooperates with Boeing, the builder of the missile system, to make sure the W89 warhead is compatible with the SRAM II missile.

"My organization is responsible for the mechanical design and the integration of the warhead into the missile," says Ed. "We design the structure that holds the warhead, and we work with Boeing on incorporating the warhead package into the missile."

Other Features of Note

The W89 has a special shipping container, known as the H1556, that protects the warhead in all normal transportation environments and is equipped with additional safety features to protect it in abnormal environments. Designed by Systems Engineering Div. 8165, the container has a clamshell-like design that allows direct access to the warhead during loading and unloading.

The W89 is the first weapon to have an electrical systems computer model that is capable of accurately simulating all the electrical functions in the warhead. The model has been validated using test data, as have other models that simulate thermal and structural responses of the warhead. The electrical systems model is the work of Reliability and Electrical Systems Div. 8113; Applied Mechanics Dept. 8240 is responsible for the thermal and structural models.

New, environmentally conscious manufacturing techniques are minimizing the use of hazardous substances traditionally associated with weapon fabrication. D-limonene, a turpene-based solvent that is not harmful to the environment, is the cleaning solvent that will be used on most of the electronic subassemblies. Helping to develop and qualify that process are Corrosion, Cleaning, and Thin Film Technology Div. 1834 and Organic Materials Div. 7472. •LD

A Show of Gratitude

Ceremony Honors Sandia Reservists Who Served in Gulf War

Sandians who served active military duty during the Persian Gulf War were honored at a special Sandia reception earlier this month.

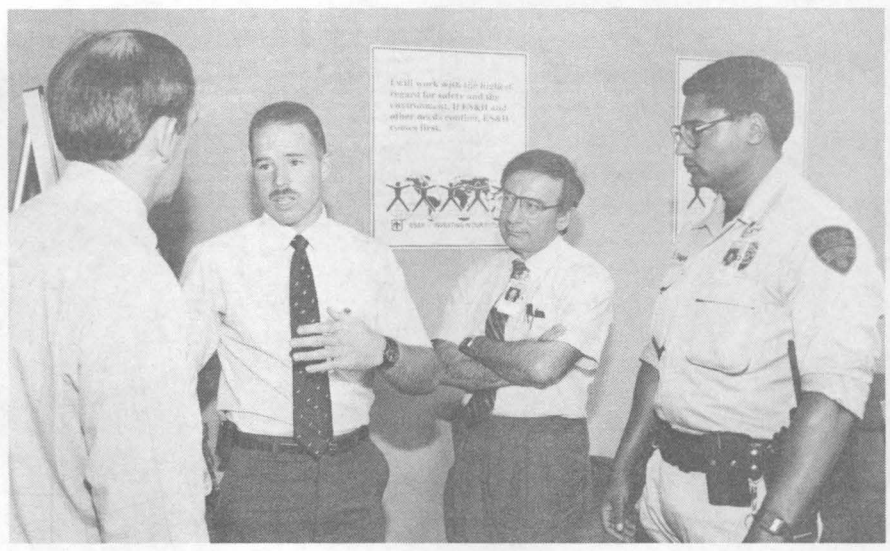
Eight Sandians, including six security guards, were honored at the ceremony, which was attended by President Al Narath, the Sandia Management Council, and other Labs officials. Those honored included Debbie Mulligan (3524), Sam Narrow (3212), and Terry Chang, Fred Gonzales, Johnny Montaño, Art Salazar, Joe Sandoval, and Tony Teague (all 3435).

Since then, another Sandian, Paul Montoya (3435), has been called to the Persian Gulf. A former part-time Sandian, Gene McPeek (3435), also served in the conflict.

A Sandia, Livermore employee, Steve Ikebe (8483), is still on active duty and is expected to return by mid-July.

Al thanked them for their participation, noting: "We're all very proud of what you've done. I know it was done at great personal sacrifice, and we're delighted to have you back."

Executive VP Lee Bray noted that Sandia had been recognized by the New Mexico Guard & Reserve as the state's outstanding employer in its support of those called to serve in Desert Storm and Desert Shield. •



JOE SANDOVAL (second from left) and Tony Teague (far right, both 3435) discuss their experiences in the Persian Gulf with Dan Hartley (5, facing away) and Bob Kestenbaum (4000) during a recent awards ceremony.

Letter of Thanks

Sandians:

We would like to express our thanks and appreciation for your generosity and support toward our families while we were away during Operation Desert Shield/Storm. It is a comfort and blessing knowing that our fellow employees were watching over our families at a time when we couldn't do that ourselves.

It is times like these when Sandians have always gotten together and showed what a big heart they have.

We feel very lucky and proud that we work with such a great group of people!

Thank you from those in Patrol Div. 3435 who served during Operation Desert Shield/Storm.

Terrence Chang
Fred Gonzales
Eugene McPeek
Johnny Montano
Art Salazar
Joey Sandoval
Tony Teague

Sandian By Day, Chile By Night

Sandian Moonlights As Pro Soccer Player

When Employment Coordinator Dave Robertson (3533) isn't helping recruit new Sandians, he's helping the New Mexico Chiles pro soccer team recruit new fans.

At the Chiles' first home game this season on May 24, Dave helped New Mexico's professional soccer team beat the Colorado Comets 3 to 1. But Dave isn't just a player — he's also a team supporter, fund-raiser, and investor. You see, Chiles don't just play — they pay.

Despite near-capacity crowds at games and a successful first-season record, the team was in financial shambles at last season's end when its main investor pulled out. The players knew if they didn't act fast, the Chiles would fold.

Together they formed the Player's Soccer Corporation and secured ownership of the "Chiles" name. They also agreed that, as players, they would no longer receive salaries but would instead invest in team shareholdings and receive a dividend at the end of the season, assuming it was a successful one.

Now, with a little help from local sponsors, the team is able to reimburse players for travel costs and to pay to use University Stadium during home games. "Players now have a stake in the team's success or failure," says Dave, who has been at Sandia since December 1989. "We do fund-raising and help spread the word. And there's a lot more 'playing up to the crowd' during games. It's the crowd that will make or break us."

First Chile Signed

Dave grew up playing soccer in Great Britain. In 1978, he moved to Albuquerque and played soccer for Highland High School, ironically under coach Larry Waters, the Chiles' new coach.

In college, he played for San Diego State University and later for UNM under his father, former UNM coach Craig Robertson. From 1986 to 1989 he played for the Albuquerque Gunners, a former semi-pro team. His next stop: the Chiles in 1989. "I'm proud to have been the first player signed to the Chiles' roster," he says. (Dave may be the only Sandian who is also a professional athlete.)

Dave says that both working and playing keep him busy. The team practices three nights a week, and players are expected to do physical training on their own time other nights. "A lot of us work," he says, "and staying in shape is a tough commitment. As players, we also have management responsibilities. But I feel fortunate that Sandia's management supports me, as long as there are no conflicts with work." Dave says he takes vacation time when he travels with the team.

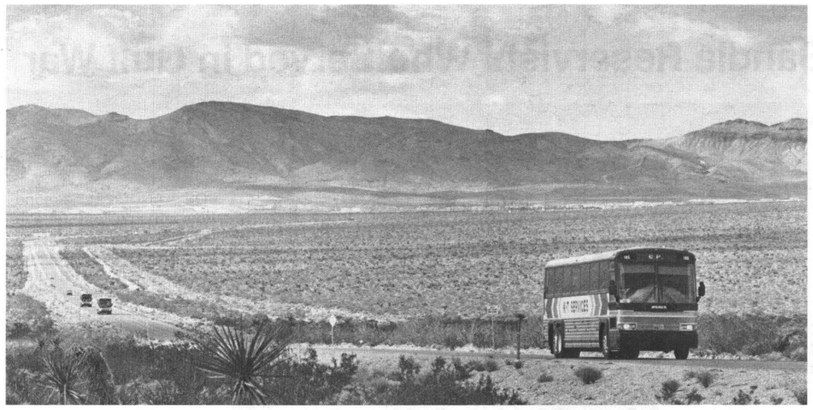
With a new coach and several talented young rookies, Dave expects the team to do well this season. The Chiles have already earned the right — as Western Region Champions — to play in the semifinals of the National Open Cup in Dallas July 12, a competitive national tournament open to teams registered with the United States Soccer Federation (USSF). The team is also playing in a new, more competitive league (the Sunbelt Independent Soccer League, with 18 teams nationwide).

The Chiles usually play on weekend nights. Their next home game is tomorrow, June 29, against the Oklahoma City Warriors (7:30 p.m., University Stadium). •JG

BEATING AN OPPONENT to the ball last Friday night is Employment Coordinator and New Mexico Chile Dave Robertson (3533). Although the Chiles lost to the El Paso Patriots last weekend by a score of 2-1, Dave was named Offensive Player of the Game. The team plays the Oklahoma City Warriors tomorrow night at 7:30 at University Stadium.

Fun & Games

Golf — Winners of the Sandia Golf Association Open held at Ladera and Los Altos golf courses on June 1 and 2 were: A Flight — low gross winner was Leon Chapman (6601); low net winners were Dave Renniger (2114), first; Jim Salas (2512), second; Ray Byrne (5267) and Dick Fairbanks (3521), tie for third; and Jose Torres (1273), fifth. B Flight — low gross winner was Dan Williams (7841); low net winners were Tim Mirabal (2172) and Carl Leishman (7412), tie for first; Robert Varga (7542), third; John Stanalonis (9141), fourth; and Robert Martinez (9118) and Dave Salas (ret.), tie for fifth. C Flight — low gross winner was Ed Rivera (9321); low net winners were Eli Perea (2543), first; Andy Wilken (9144) and Duane DeWerff (9118), tie for second; Randy Cusenbary (5143), fourth; and Kenneth Ronquillo (7313), fifth.



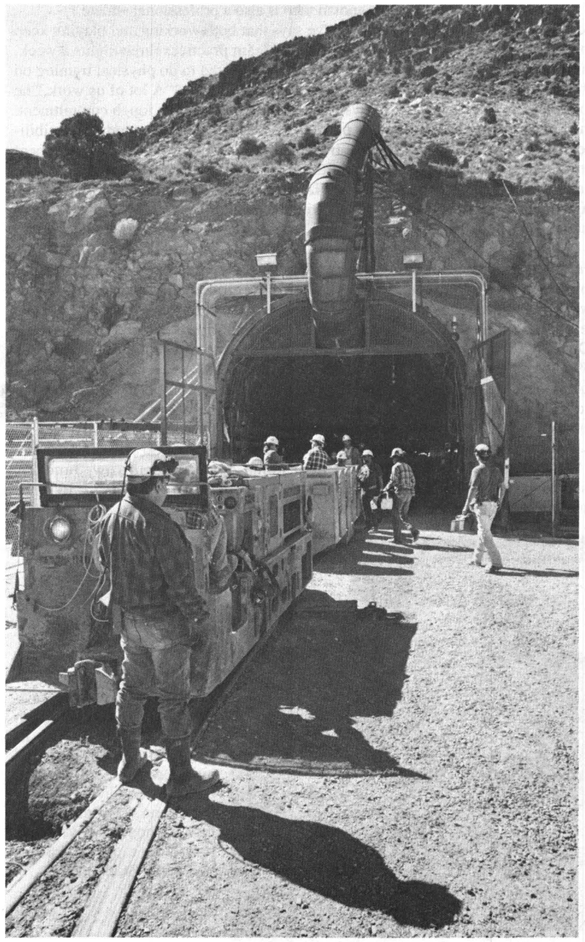
BUSES ROLL out of NTS for the 60-mile ride back to Las Vegas. Most NTS people commute by bus.

A Look at the Nevada Test Site

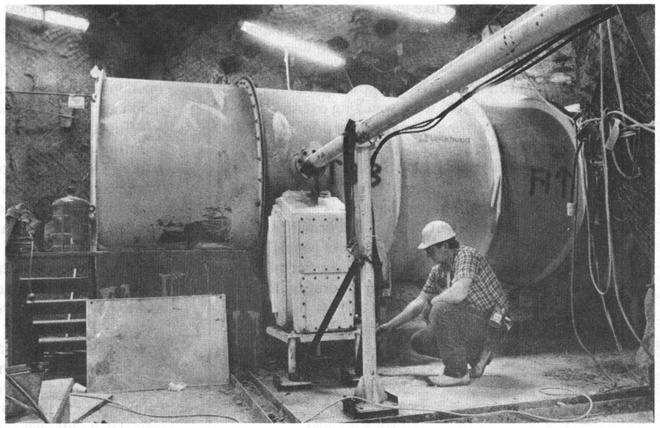
An "underground" group is one that's generally considered to be out of the mainstream. But at the Nevada Test Site (NTS), about 60 miles northwest of Las Vegas, underground activities are the center of attention. About 30 Sandians are permanently assigned to NTS, though hundreds of others may travel there when hardware they are working on, or an experiment they are conducting, is involved in an underground nuclear test. Because the Labs' NTS work primarily consists of effects testing for DOE — the effects of nuclear radiation — Sandia's tests are conducted not in the vertical holes used for nuclear-explosives testing, but in horizontal tunnels bored into the sides of mesas. The Labs works with the Defense Nuclear Agency in cooperative programs to execute these tests. Sandia also provides support for some of the other weapons labs' work. These photos show some typical tunnel scenes, as well as samples of Sandia's aboveground activity.

Photos by Mark Poulsen (3162)

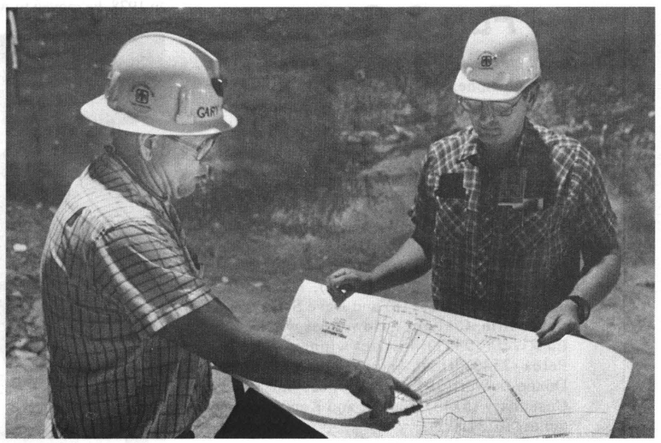
TUNNEL WALKER strides toward the entrance of P Tunnel.



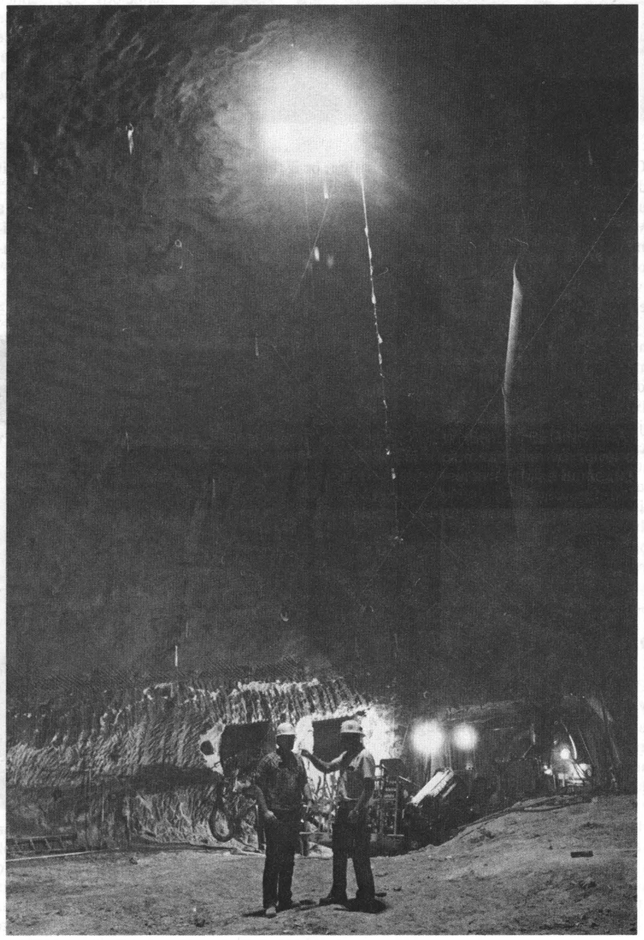
START OF SHIFT — Riders climb aboard the train that will take them to work areas as far as 5,000 feet inside the tunnel.



WHERE IT BEGINS — A nuclear device will be placed inside the end of this line-of-sight pipe; radiation will travel down the pipe to experiments located hundreds or thousands of feet away. Mike Burke (9324, seen here) is assistant project leader for the test.



GARY MILLER (left) and Mike Burke (both 9324) check a drawing that shows where instrumentation will be located for an upcoming test.



DOME TEST SITE — Mike Burke and Gary Miller examine a 36-foot-high dome that is being prepared for a future test.

MACHINE SHOP supports Sandia tests. Chuck Wimmer (9331) and Linda Land (contractor) discuss the setup of a numerically controlled milling machine.

DON SHADEL (9331) has developed a series of TV cameras for downhole viewing. The 80-pound camera Don is displaying was, he says, "conceived, designed, and built" by Sandia at NTS. Other models fit inside vertical holes as small as 4 inches in diameter.

COLLECTION OF DATA from tests is the purpose of this room, staffed by employees of EG&G under technical supervision by Sandia. Most data is now carried out the entrance of the tunnel by fiber optic cables and transmitted several miles for central collection. Formerly, it went vertically through drill-holes to the mesa top for recording on equipment housed in trailers.

In Ceremony Dating Back to 15th Century

Simmons Gets Honorary Doctorate from Swedish University

"The ceremony was magnificent — I'll remember it forever," says Gus Simmons, in describing festivities in late May when he received an honorary Doctorate of Technology degree from the University of Lund (Sweden).

Gus (Org. 200) received the degree in Sweden during a ceremony that dates back to the 15th century. The degree recognizes his contributions to communications science and information integrity, and the diploma calls him the "father of authentication theory." Gus has had a close relationship with the University of Lund for many years through his work in cryptology — the study of the enciphering and deciphering of messages in secret code.

He is now Senior Fellow for National Security Studies at Sandia, a position he has held since 1986 (LAB NEWS, Dec. 19, 1986). The senior fellow position — equivalent to rank of director — was created for a limited number of employees who have shown "continuing contributions of truly exceptional breadth, depth, and creativity in fields impacting the technical mission of the Labs." Gus was the first Sandian to be named to the position.

"The ceremony in Sweden was straight out of the Middle Ages. The academic procession is led by trumpeters and standard bearers carrying huge, colorful silk banners — the standards

"The academic procession is led by trumpeters and standard bearers carrying huge, colorful silk banners."

of the various districts of Sweden. The procession starts at the University and winds through the very lovely Lundagård [park] and into the cathedral built in the 12th century. The Rector Magnificus of the University — what a wonderful title! — and various church officials preside, and the ceremony takes place entirely in Latin."

Ceremony with a Bang

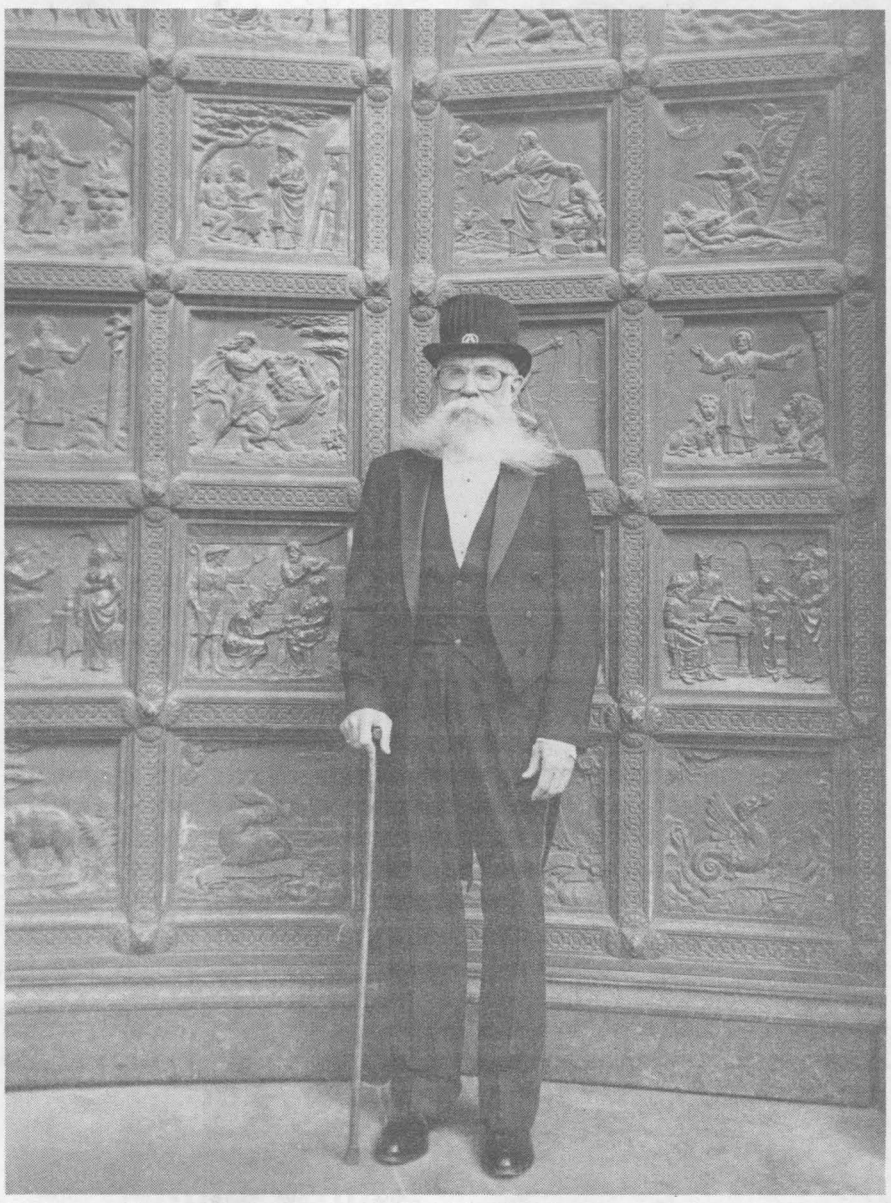
"Parts of the ceremony are a little disconcerting," continues Gus. "They lower a top hat onto your head, and at the exact time that it touches your head, they fire a cannon outside the cathedral. It shakes the whole cathedral and also shakes up the poor honoree, who's already plenty nervous."

The oversized diploma that Gus received was also printed entirely in Latin. He jokes about some of the flowery language and was reluctant for the LAB NEWS to print a translation, but he says some of the information in the ceremony program, printed in Swedish, actually sounds pretty good to him. "It doesn't seem too bad being called a 'professionell paranoiker,' " says Gus, "but some things are better left untranslated."

Before assuming his current Sandia position, Gus was Manager of the Applied Mathematics Department, and earlier he supervised a division devoted to the command and control of nuclear weapons. In those positions he has been concerned with questions of information integrity relating to national security, such as weapon command and control, verification of compliance with arms control treaties, and individual identity verification at sensitive facilities.

Gus is a major reason why Sandia is considered a leading center for research in data security and authentication. He says that most of his work has been aimed at "making it possible to trust the functioning of complex systems in which none of the inputs or participants are particularly trustworthy. The idea is to find all ways — and all reasons — for cheating in information-based systems, and then prevent the cheating, or if this isn't possible, to make sure that it is discovered."

One of Gus' avocations is magic. He is a member of the International Brotherhood of Magicians, and says he has "thereby gotten good insights into the difficult art of cheating." •LP



GUS SIMMONS, Senior Fellow for National Security Studies 200, poses in front of the cathedral at the University of Lund (Sweden) where he received an honorary Doctorate of Technology degree. The bronze cathedral doors, about 12 feet tall and showing various biblical and historical scenes, were so heavy that he could barely open and close them, Gus says. And no, he didn't get his trademark beard specially fluffed for the occasion. A stiff updraft lifted it up and out just as his daughter, Karen, was taking this photo. The University of Lund, founded in 1666, is the second oldest Scandinavian university and one of the oldest universities in Europe. The cathedral was built in the 12th century, predating the university by more than 500 years. The top hat that Gus is sporting, given to him during the ceremony, includes the symbol of the University's College of Technology. Gus planned to wear the hat on his return trip, but says when it came time to board the plane, even he wasn't quite eccentric enough to don it, so he brought it back in a hat box.

Sympathy

To Francine Island (7323) on the death of her sister in Dallas, May 17.

To Raymond Griego (3426) on the death of his brother in Albuquerque, May 30.

To Ben Sedlack (7263) on the death of his father in Albuquerque, May 30.

To Connie (3144) and John (5154) Souza on the death of her mother and his mother-in-law in Albuquerque, May 31.

To Becky Villane (2900) on the death of her father in Albuquerque, June 7.

To Jim Hann (6318) on the death of his brother in Zanesville, Ohio, June 7.

To Patti Valles (7472) on the death of her mother in Las Cruces, June 12.

Congratulations

To Laura (6316) and Cyrus (3426) Latoma, a son, Bryan, May 22.

To Marie and John (1554) Henfling, a daughter, Amanda Renee, May 27.

To Cathy and Bill (400) Mairson, a son, Thomas William, June 3.

To Denise and Matthew (2343) Sena, a daughter, Nia Alexandria, June 7.

To Kathryn Bentley (9312) and Richard Fortune, married in Albuquerque, June 8.

To Shirley and Mike (5131) Hall, a daughter, Kathryn Sarah, June 9.

To Debbie and Jeff (9222) Rienstra, a son, Nicolas, June 11.

IT'S NOT FUNNY when you get your photo in the LAB NEWS and your name is misspelled. Thank goodness, that doesn't happen often, but it did when we misidentified Barbara Staley (3522) as "Stacey" when we printed her photo several issues back along with two other Sandians in the "magical clown" group who perform for various functions. Barbara goes by Mitzie when she's in this outfit.

Sandia News Briefs

Riley Joins State Law Enforcement Academy Board

Ann Riley (3726) has been named by Gov. Bruce King to serve on the state Law Enforcement Academy board, which sets minimum training standards for all law enforcement agencies.

Ann, a contracting representative who joined Sandia eight years ago, is the only woman and only civilian on the eight-member board. She will serve until 1992.

Ann says the board is interested in using some of Sandia's contracting techniques, such as evaluation and scoring of proposals and cost evaluation. Board members were to meet this month with Jim Martin, Sandia's Director of Security and Facility Support Services 3400, to exchange ideas and information.

Mancini Named Chair of ASME Division

Tom Mancini (6216) was recently elected Chair of the Solar Energy Division of the American Society of Mechanical Engineers (ASME).

Tom joined Sandia five years ago after serving as professor of mechanical engineering at New Mexico State University for 10 years. He is responsible for parabolic dish development for dish-Stirling electric systems, in which an engine at the focal point of a dish is heated by solar energy to drive a generator that produces electricity.

Tom has written about 50 publications in solar energy and other energy-related fields. He has been active in the ASME Solar Energy Division for 15 years, chairing the Solar Thermal Committee and other task forces and serving as program chair for several division conferences.

Sandians Contribute to Space Exploration Study

Three Sandians — Larry Trost, Jim Purvis, and Kent Biringer, all in Arms Control Study Div. 9415 — served on a NASA study team that announced its recommendations recently for achieving President Bush's Space Exploration Initiative (SEI).

Called the Synthesis Group, the study team was established by NASA a year ago to evaluate ideas from government, industry, and the public for constructing a space station, establishing a human outpost on the moon, and exploring Mars — all goals of the SEI announced by Bush in 1989.

Larry worked on the group's chemical propulsion, life support, and schedule and milestones teams. Jim served as technical advisor on the propulsion specialty team and prepared briefing charts and papers for the leader of the NASA project, Air Force Lt. Gen. Tom Stafford. Kent served on the power specialty team, which reviewed power requirements for lunar and Mars spacecraft, habitats, and other operations.

X-Ray Experiment Carried Sandia Components

A system designed by Thermal and Fluid Engineering Div. 1513 kept an astronomical experiment warm on board the space shuttle while it orbited 140 miles above the Earth in April, reports Ron Akau (1513).

In addition, electronic systems, software, and mechanical systems designed by Sensor Systems Div. 9231 and Design Development Div. 9213 kept the Uniformly Redundant Array (URA) operating as it mapped X-ray sources in space, notes Joe Chavez (9231).

The URA project is a joint effort of Sandia, Columbia University, and LANL. Sandia was responsible for design, development, and installation of the URA thermal control system. Temperature-control hardware included heaters, thermostats, and selective surface-metallized materials. Multilayer insulation blankets were made by Sandia's Parachute Laboratory, supervised by Ron.

ES&H Contributions Recognized

Six Sandians in Energy Programs 6000 were recognized for significant contributions to ES&H, through a new awards process in which any 6000 employee can nominate another employee.

Richard Simpson (6423) was recognized for a portable field device for disassembling experimental apparatus safely with minimal hazardous waste generation. Phil Kuhlman (6257) was honored for developing two exemplary Standard Operating Procedures (SOPs) for light electrical/mechanical laboratories.

Christi Leigh (6613) was recognized for establishing a white paper recycling program in Bldg. 823. Jim Moreno (6217) was honored for designing a superheated steam cleaning system for solar receivers that uses chemical substitutes and waste reduction.

Duane Stenberg and Dave Bronowski (both 6323) received a team award for identifying and correcting ES&H issues in the laboratory of Bldg. 883 and serving as positive role models for other employees.

Each person was honored with a plaque on permanent display in the lobby of Bldg. 823, an engraved pen set, and a ceremony in the vice president's office.

Send potential Sandia News Brief items to LAB NEWS, Div. 3162.

SAILING INTO SANDIA last week for briefings was Admiral David Jeremiah (right), Vice Chairman of the Joint Chiefs of Staff, seen here with Rear Admiral Mack Gaston (left), Commander, Field Command, Defense Nuclear Agency, at Kirtland AFB, and with Labs President Al Narath. Admiral Jeremiah and other military officials were briefed by Sandians about the weapon program in general and about Labs work on the new W89 warhead that's being developed for the Short Range Attack Missile (SRAM) II. The visitors also learned about various projects in Exploratory Systems 9000.

(Continued from Page One)

Special Bike

During the second semester, two NMSU students — Robert Jones and Andrew Engelmann — designed a brake mechanism that worked something like a coaster brake but attached directly to the bike's pedal crank. As their final class project, they built a working prototype of the brake and installed it on a 21-speed mountain bike. The bike was presented to Hugh May 17 in Las Cruces. "It was nice to design and build something that Hugh could actually use," says Engelmann.

"The bike rides very well," says Hugh, who has been practicing his riding since the presentation. "I haven't ridden a bike since I came down with arthritis, so I'm unsure of myself at times. With practice and a few improvements, perhaps the bike will work even better. I appreciate the effort Andrew and Robert put into the bike."

O'Neill plans to ask next semester's students to optimize the bicycle for Hugh, including making the brake mechanism more efficient, adjusting the force necessary to operate the gears, and adding a few stabilizing features to the handlebars.

"It's hard to find a hands-on project that students can get their teeth into," says Ruben. "I'm pleased to see hardware progress from an idea; that's what makes my job interesting."

The new brake mechanism uses a modified aluminum sprag clutch from a General Motors automatic transmission. The aluminum disk (weighing about four pounds) attaches to the left side of the pedal crank and rotates with the pedal. It's engaged just like a coaster brake, but the similarities end there. When Hugh reverses the pedals, eight ball bearings inside become wedged between two cylindrical plates. The outside plate — which is attached to the bike's caliper brake cables — provides the force necessary to bring the bike to a stop.

Commercial Potential?

"The mechanism has some potential commercial applications," says O'Neill. "It may be useful for people who have difficulty working hand-lever brakes, such as people with disabilities. We still need to explore its potential uses and commercial value."

Hugh Bivens Sr. says, according to the owner of a local bike shop, some people don't like normal bicycle hand brakes, suggesting that a commercial market may exist for the mechanism. "The challenge is to design something that can be manufactured but that doesn't add too much to the price of a bike," he says.

John Otts (35), director of Sandia's liaison program with NMSU, says the bicycle brake O'Neill's students designed is an example of the benefits of a new collaborative research effort between Sandia and NMSU.

John works directly with NMSU's vice president for research and has been responsible for initiating a variety of new research collaborations with Sandia. The third Sandian currently assigned to NMSU is Bill Burd (7483). •JG

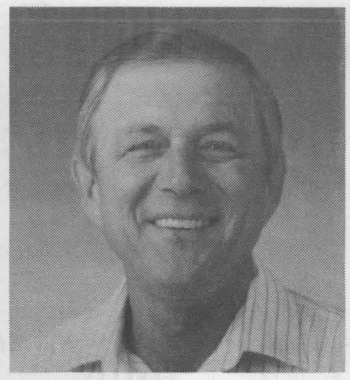
Retiree Deaths

George Hutchinson (73)	May 2
Alice Warder (91)	May 4
Raleigh Pickering (78)	May 5
Reinhart Gauerke (69)	May 6
Howard Johnson (76)	May 17
Lemme Shew (74)	May 20
Bernard Hussey (83)	May 20
Mason Writtenberry (72)	May 28
William Holder (73)	May 26

MILEPOSTS

LAB NEWS

June 1991



Richard Orzel
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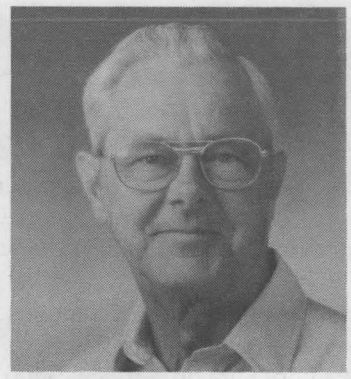

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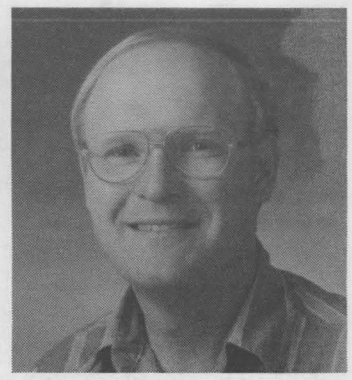

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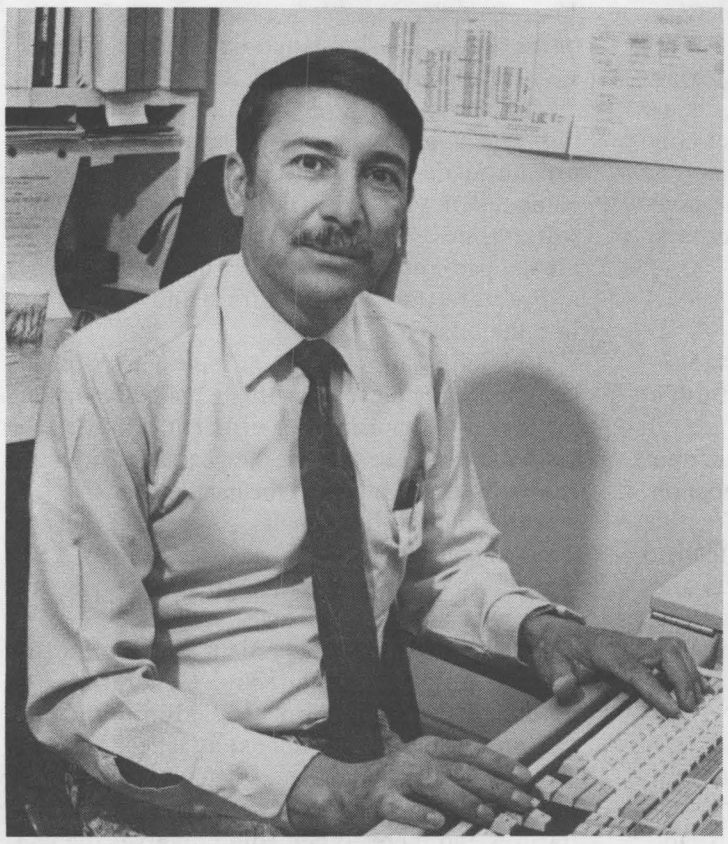

Carmel Chavez
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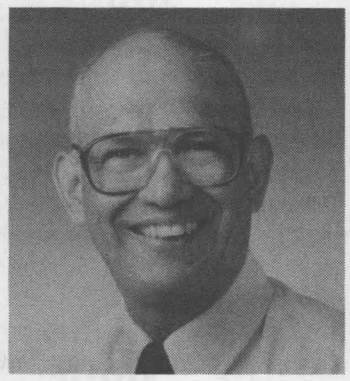

Ruben Urenda
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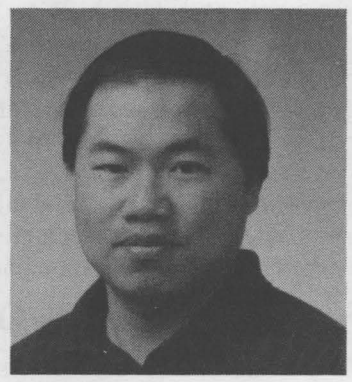

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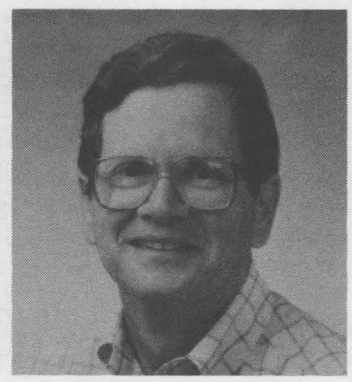

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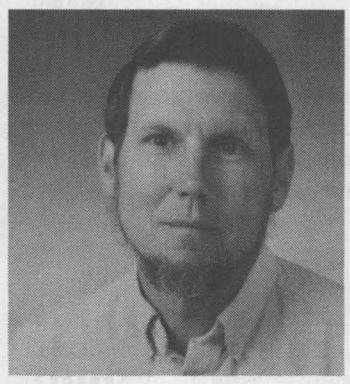

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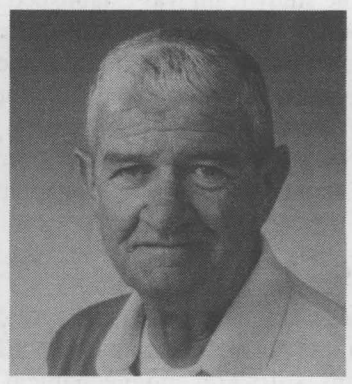

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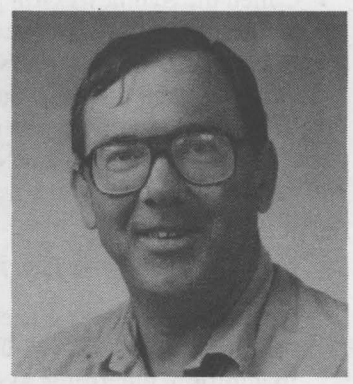

Richard Meyer
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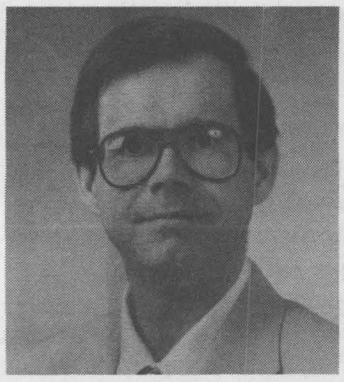

Ronald Hartwig
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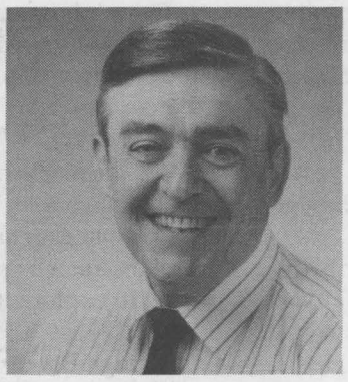

Roger Thorp
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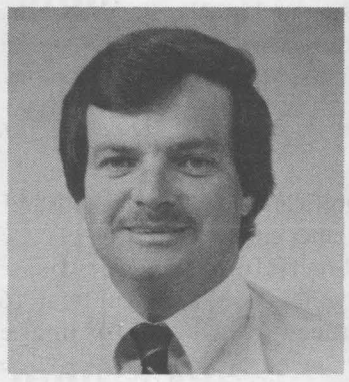

Finis Long
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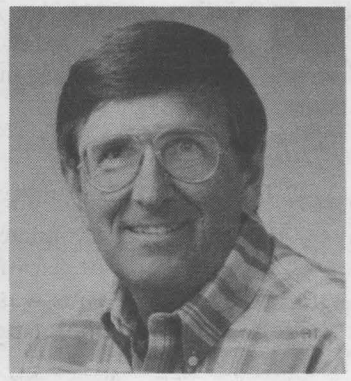

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Bill Richard
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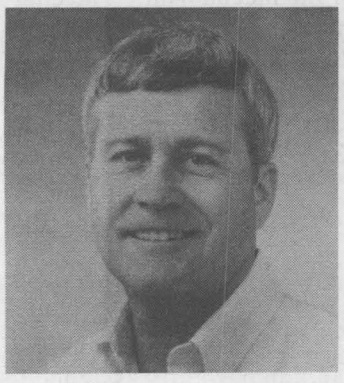

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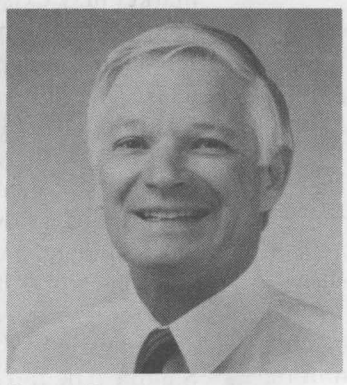

Byron Dean
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Charles Borgman
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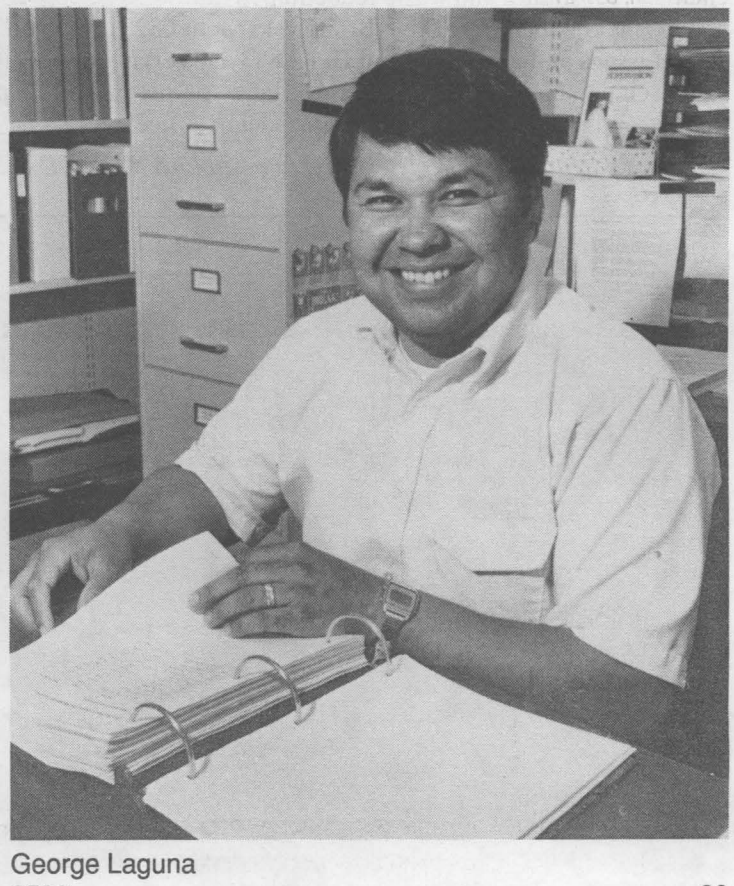

George Laguna
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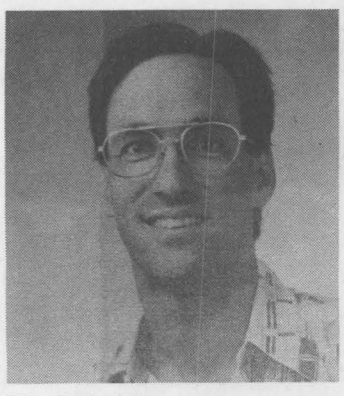

Martin Imbert
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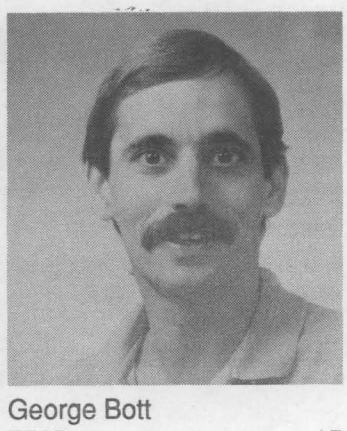

George Bott
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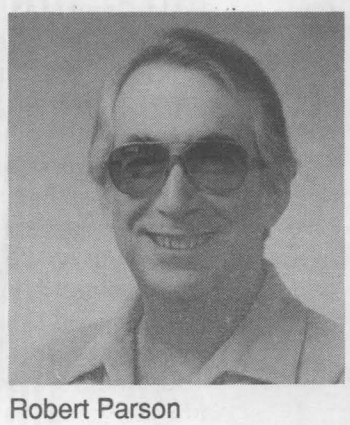

Robert Parson
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feedback

Question: MTSs can sign small-value purchase requests regardless of the amount of time they have worked at Sandia. STAs with many years of tenure at Sandia cannot. This makes for an awkward situation when an STA in a project-lead position has to have an MTS who is assigned to him or her sign the purchase request. Any chance of remedying this situation?

Answer: Sandia's acquisition approval levels are modeled after those of AT&T in accordance with a provision of the prime contract between DOE and AT&T. As AT&T does not generally delegate acquisition approval authority to employee classifications below staff level, neither does Sandia.

However, a project is under way to establish approval authority for project managers, regardless of their classification, under Sandia's project management system. Once the project management system is in place and projects have been established under the system, appropriate approval authority will be implemented.

Paul Stanford (100)

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 8½ 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.
13. "Work Wanted" ads limited to student-aged children of employees.

MISCELLANEOUS

LEER FIBERGLASS SHELL, fits full-size pickup, pass-through window, sliding side windows w/screens, interior light, $350. Zaorski, 281-9194.

KITTENS: 1 black, 2 tabbies, 9 wks. old. Martinez, 877-4744, ask for Juanita.

EXECUTIVE DESK, L-shaped, 2-level, 5-drawer, w/chair, $195. Miller, 268-5992.

BEDROOM SET, complete, solid oak, $600. Riley, 869-2119.

GAS DRYER, white, Speed Queen, $290. Pompeo, 266-7930.

TELEPHOTO LENS, Vivitar 200mm , used once, $50; new fondue set, $10; pasta cutter & racks, $20. Anderson, 897-2772.

UPGRADE FOR XT: Intel inboard 386, 80387, 4Mb RAM, Windows 3, valued at $2,400, asking $1,000 OBO. Lambert, 293-8825.

UPHOLSTERED CHAIRS, matching pair, green, barrel-back, $50 for 2. Wagner, 881-4840.

SLIDING PATIO DOORS, 2 sets, standard 6-ft. doors, 1 frame, 1 screen, $25/all. Harris, 271-2216.

LAWN MOWER, Sears Craftsman, 20-in., 4-hp, $70. Breeding, 260-0820.

CHROME SPOKE RIMS, 4, 15x7, 6-lug, $15/ea.; 4 white Nissan 4x4 rims, $10/ea. Weigand, 892-7253.

QUEEN-SIZE SOFA SLEEPER, brown tones, upholstery needs repair, $175. Renn, 299-2453.

TOOL BOX, fits full-size truck bed, $50 OBO; lawn mower, Craftsman rear-bagger, needs work, $25 OBO. Fleming, 888-0744.

BABY ITEMS: bassinets, 2 for $25, 1 for $10; swing, $10; changing table, $10. Dingman, 292-6934.

BABY CHANGING TABLE, $20; wood-burning stove, $299. Randour, 298-5684.

EVAPORATIVE COOLER, 4800/5800, 3/4-hp motor, ductwork, $150; 19-in. B&D mower, rear bagger, $125; Schwinn Airdyne exercycle, $450 OBO. Mooney, 281-2612.

SHAPER, woodworking, extra carbide bits, $350 OBO. Schwentor, 884-3965.

KITTENS, 1 gray, 1 tan, free to good home. Dennis, 275-7365.

SOFA, 7-1/2-ft. long, wide cushions, $200; coffee table, $40, end table, $30. Bland, 265-6286.

WOODEN ARMY BUNK BEDS, no mattresses, $25; French Provincial headboard and footboard, blue, rails, canopy frame, $25. Leisher, 281-5258.

LUGGAGE: 48-in. garment bag, $30; 26-in. w/wheels, $35; 27-in., $30; 24-in., $25; cosmetic case, $20; 18-in. overnighter, $20. Erickson, 298-4416.

POOL, Sears above-ground, 18' x 4', complete, w/filter, pump, ladder, chemicals, lounge chair, $150. Kicklighter, 897-7247.

CHROME-CRAFT DINETTE, glass top, 42-in. octagonal table, w/4 chairs, $400. Mitchell, 299-5144 after 3:30 p.m.

LAWN MOWER, 21-in cut., 4-hp, rear catch, used 1 summer, $125; smoker, $25. Smith, 292-6425.

CHINTZ DRAPES, lined, Waverly print (yellow/orange/green daisies on white background), 65"W x 57"L, decorative traverse rod, $30. Bear, 881-7128.

CHROME SPOKE RIMS, set of 4, 12x15, fits 5-lug Fords, $60. Nelson, 881-0148.

KROMEX CANISTER SET, brown & copper, $8; woman's dress shoes, 1 red, 1 tan, $2.50/ea.; wall basket, pink & red flowers, $4. Smith, 299-7151.

GOLF CLUBS: irons, 3-PW, Haig-Ultra, new grips, top-line clubs, $95. Norwood, 292-0072.

225-AMP ELECTRICAL SERVICE w/breakers, $150; wrought-iron window covers, $35/ea. Dean, 299-3281.

POWER CASTER, touch of a switch moves trailer forward or reverse, $400 or trade. Ashmore, 881-4653.

RV AWNING, A&E 8000, 11-ft., coffee, mounted, $325. Randolph, 299-2057.

MOSLEY RV-4C VERTICAL ANTENNA, w/instruction sheet, $150 list, sell for $100; electric paper chopper, $200. Balint, 298-2642 after 6 p.m.

EXERCISE MACHINE, Powerglide combination cross-country skiing and rowing machine, $65. Richardson, 293-4219.

COCKER SPANIEL PUPPY, AKC-registered, 6-wk.-old female, $150. Oglesby, 296-5361.

STEEL DESK, (old Sandia-style), beige paint, gray top, double pedestal, file drawer, locks, $35. Moore, 345-4030.

BACK SWING, $120; kittens, black & white, free; Osborn PC, $40; IBM monitor, B&W, $15. Orear, 344-3460.

TYPE-O-GRAPH, makes color graphs, various size letters, calculates, AC or batteries, $25; Sears typewriter, manual, portable, $25. Fisher, 298-0526.

AIR CONDITIONER, window, 4,000-Btu, GE, $125 OBO; new front bumper for Horizon/Omni, fits '78-present models, $95 OBO. Van Deusen, 299-4328.

RV LEVELERS, drive-on, stair-stepped, 7-in. maximum, $30. Hole, 255-1444.

LORTONE BARREL ROCK TUMBLER, 6-lb. capacity, $50; Gy-roc Vibrahone vibrating tumbler, 2-1/2-lb. capacity, w/piggyback attachment, $75. Dunkin, 293-8801.

DINING TABLE, pecan, w/inlay pattern, 55" x 72"-110", Santa Fe Collection by Thomasville, $950 OBO. Womble, 299-9596.

OLDS. 350 THM TRANSMISSION, $50. Norwood, 266-2717.

PORTABLE DISHWASHER, GE, large-capacity, cutting-board top, pot scrubber, energy-saver, harvest gold, $100 OBO. Barnard, 831-4114 evenings.

GIRL'S BEDROOM SET, 7-piece, ivory w/pastel detail, $650. Zaffrey, 294-6768.

GARAGE SALE: arts & crafts show, misc. household items, jewelry, art, 2 households, 920 Idlewilde Lane SE, June 28-30. Olson, 265-3947.

WROUGHT-IRON BIRDCAGE, large, $125; Sears electric dryer, $125; Sears washer, needs work, $50. Pullen, 291-0666.

WATERBED, super-single-size, bookcase headboard, frame, needs new heater, $70. Black, 293-2755.

COCKER SPANIEL PUPPY, 16-wks. old, buff-color male, to good home. Lovato, 292-2822.

LAWN EDGER, 2-hp gas-powered 4-cycle engine, 2 wheels plus curb wheel, $120. Oberkampf, 292-4366.

CAROUSEL SLIDE TRAYS, 8, for 140 slides ea., $9/ea.; Cleveland trombone, w/case, $35. Schmidt, 821-2917.

LEATHER JACKET, Western style, new, rust color, size 44. Garcia, 344-3406.

COMMODORE 64 COMPUTER, 1541 disk drive, joy sticks, Okimate 10-color printer, software, manuals, programs, $250. Floyd, 836-3601.

CAMPER SHELL, home-built, solid, for '90 Chev. long-wide pickup, $200 OBO. Scranton, 869-6589 after 6 p.m.

SHOPSMITH MARK 5, w/3-level caster system, buck chisels, accessories, used once, $1,000 OBO. Mufich, 898-2877.

STANDARD SINGLE BED, captain's style w/storage below, foundation & mattress, $70; small Toro snowblower, $50. Goetsch, 892-8366.

STEREO POWER AMP, Hafler DH-200 110W/ch., w/upgrades, Crown IC-150A preamp, Pioneer TX6500 tuner, $350 OBO. Brooks, 275-0056.

BROTHER ELECTRIC TYPEWRITER, $75; Emerson stereo, 8-track, tuner, player, $65; wicker bassinet, $15; Coleman catalytic heater, $35. Mills, 299-2130.

SINGLE BED, frame, flat spring, mattress, pillow, $20; double bed, head & foot rails, maple wood, pillows, $25. Stang, 256-7793.

ANSWERING MACHINE, w/telephone, memory dialing, ringer doesn't work, $20. Montoya, 296-4268.

SYLVANIA SUPERSET and RCA color TVs, both non-working, free. Carpenter, 294-1372.

TRANSPORTATION

'86 VW JETTA GL, blue, 4-dr., 5-spd., PS, AC, sunroof, AM/FM cassette, 82K miles, $4,500. Mayer, 294-2531.

'76 CHRYSLER CORDOBA, needs engine work, recently overhauled transmission, $350 OBO. Chavez, 842-6374.

'81 MERCEDES 380SLC, diamond blue, leather, electric sunroof, 58K miles, 20/26-mpg city/highway documented, $25,392. Romero, 345-1123.

'79 GRAND PRIX, PS, PB, AC, 2-tone silver, red cloth interior, $1,000 firm; '82 Suzuki RM125, new top & bottom end, new tire, $800. Weigand, 892-7253.

'83 BMW 320i, silver, 5-spd. manual, 93K miles, AC, AM/FM cassette, $6,500 OBO. Hays, 883-1805.

'80 FORD 150 RANGER LARIAT, has everything including 4-WD, AT, AC, PS, PB, shell camper package, $4,950. Schowers, 822-8494.

CENTURION ROAD BIKES, 2, 23-in., 10-spd., 1 ultralight, 1 never ridden, $165/ea. Paulsen, 823-2440.

'78 OLDS. DELTA 88, 2-dr., PS, PB, AT, AC, power locks, windows, seat, new tires, shocks, 106K miles, $1,000 OBO. Carson, 296-9343.

BICYCLE, Vitus aluminum 55cm frame, silver, w/Shimano 600 group, Look pedals, $495. Dale, 291-9020.

'87 BMW, 3K miles, red colors. Waddles, 275-7966.

'86 NISSAN HARDBODY PICKUP, 77K miles, white, 2-WD, 4-cyl., radio, shell w/bed mat, $3,500. Rieger, 281-0757.

'67 VW BUG, 1,500cc, 12-volt, AM/FM cassette, 5K miles on rebuilt engine, new paint, interior, $2,350 OBO. Irwin, 294-4644.

'83 FORD THUNDERBIRD, 80K miles, rear window defrost, cream exterior, brown interior, $3,200 OBO. Weinmaster, 298-1620.

'88 MERCURY COUGAR, PB, PS, PW, leather interior, digital door entry, new tires, 37K miles, $8,800. Deloach, 831-6459.

'88 LINCOLN CONTINENTAL, Signature Series, transferrable extended warranty, leather, below book, $14,800. Schulze, 298-9328.

'70 VW BUG, parting out. Smith, 292-6425.

'89 CHEV. ASTRO VAN, 8-passenger, AC, PL, tilt, AM/FM cassette, cruise, 42K miles, $10,995. Scott, 294-4240.

'83 PONTIAC FIREBIRD, white, 5-spd., 2-dr., AC, AM/FM cassette. Dean, 275-7084.

'81 CHEV. MALIBU CLASSIC, 2-dr., all power, AC, AM/FM stereo cassette, 31K miles, $4,000 OBO. Cook, 821-8268.

'30 MODEL "A" ROADSTER, partially restored, engine & power train OK, refusal rights reserved. Neil, 884-4461.

'71 LARSON GLASPAR SPORT BOAT, 15-ft., 85-hp Johnson outboard, full cover, skis, $2,700 OBO. Brusseau, 891-2841.

LUND BOAT, 14-ft., Shorelander trailer, '90 Evinrude 25-hp, seats, electric troll, downrigger, cover, more, $3,600. Savage, 296-0528 evenings.

'74 DATSUN 260Z, new paint, needs minor work, $1,900 OBO. Torres, 299-5789.

'89 HONDA CIVIC Si, hatchback, 5-spd., AC, sunroof, AM/FM cassette, custom wheel. Ewing, 823-1112.

'65 TOYOTA LANDCRUISER, 3-spd., $1,000 firm. Garcia, 828-8705, leave message.

10-SPD. BICYCLE, Schwinn Varsity, 27-in., upright handlebars, $35. Hole, 255-1444.

'85 FORD PICKUP, 3/4-ton, 4-WD, 36K miles, extras, $8,100 OBO. Gurule, 294-6541.

WOMEN'S 10-SPD. BICYCLES, 2, 26-in., $50/ea.; '85 VIP Kona ski boat. Pullen, 291-0666.

MOTORHOME, Gulfstream El Cap, 27-ft., 6K miles, extras, cost $43,000, sell for $23,500. Wilkins, 299-4640 after Monday.

'72 DATSUN PICKUP, w/Gem Top shell, extra parts, $1,000 OBO. Andrews, 256-3467.

'79 CHEV. CAPRICE CLASSIC, 4-dr., V-8, all power, $1,600. Bitters, 275-8327.

'86 FORD ESCORT GT, one owner, 67K miles, AC, AM/FM cassette, $4,000. Witt, 888-3307 after 5 p.m.

'74 FORD PINTO, rebuilt engine, $500 OBO. Gabaldon, 892-4621.

'81 YAMAHA IT OFF-ROAD DESERT BIKE, w/service manuals, $550 OBO. Page, 275-1665.

'78 DATSUN 510 WAGON, needs radiator, has new brakes & tires, 4-dr., 4-spd. manual, 2-liter, $600 OBO. Blickley, 293-4694.

BASS ATTACKER BOAT, 50-hp Mercury, tilt & trim, trolling motor, fish finder, canvas top, stored indoors. Forsythe, 298-4034.

'89 FORD PROBE GT, AC, 5-spd., cruise, power everything, new tires & struts, 35K miles, $9,950. Mauldin, 293-3763.

'79 FORD F-150 PICKUP, 6-cyl., 300 engine, 4-spd., w/LWB shell, new tires, upholstery, battery, white w/blue stripes. Garcia, 888-4735.

REAL ESTATE

2-BDR. HOME, Rio Rancho, 1-3/4 baths, 1-car garage, vaulted ceilings, enclosed porch, landscaped front & back, assumable, $5,500 down, $406 PITI monthly. Baker, 892-3357.

3-BDR. HOME, Rio Rancho, 1,200 sq. ft., 1-3/4 baths, solar, outside security lights, landscaping. Jimenez, 891-3139.

2-BDR. TOWNHOUSE, Snow Heights area NE, 2 baths, 2-car garage, fireplace. Waddles, 275-7966.

4-BDR. HOUSE, custom-built, mountain living, 2,200 sq. ft., 2 decks, mountain views, 20 min. from Albuquerque. Lyons, 281-9283.

2-1/2 ACRES, South 14, some restrictions, electric & phone, good water area, $5,000 down, $20,000 REC. Clark, 281-1243.

1-BDR. CONDO, SE, pool, hot tub, $16,500 or trade. Bozone, 242-8295.

VIEW LOTS, Elephant Butte Estates, zoned R-1, approx. 1/4 acre ea., near golf course & lake, terms flexible. Forsythe, 298-4034.

3-BDR. HOME, 2 baths, formal living & dining rooms, den, 2-car garage, solar, assume FHA or refinance, Indian School/Tramway. Pershall, 299-9682.

WANTED

ECONOMY CAR, low mileage, in good condition. Coleman, 884-5009.

TEXAS RANGERS FANS to start a Texas Rangers fan club in Albuquerque. Hammond, 294-2045.

TEACUP POODLE, silver or white female, to breed w/silver male, AKC-registered. Salgado, 899-8207.

CANOE TRAILER, single. Kupferman, 265-7224.

GAS REFRIGERATOR, prefer trailer-type, must be in good condition. Pritchard, 299-3543.

DRUM SET, for student. Douglas, 281-9843.

STUDENT NEEDED for yard work, pay negotiable, near Moon and Montgomery NE. Sorrell, 292-0874.

SLIDING PATIO DOORS, 72-in., double-paned glass, w/frame. Janik, 293-2420.

UNICYCLE, for adult, new or used, in good shape. Garcia, 344-3406.

KITCHENAIDE STAND MIXER, infant's bicycle helmet, 30-gal. aquarium w/hood & accessories. Reuss, 889-3641.

Coronado Club Activities

Try Tonight's 'Dollar-Day' Buffet

FRIDAY-NIGHT FUN begins at 5 p.m., when yet another C-Club "Friday Dollar-Daze" takes place. The pool and patio are open until 9. The cost: free for members with pool passes, $1 for Club members without passes, and $2 for non-member guests. A reasonably priced patio buffet is served from 5 to 7 p.m.

LAST CALL — The last Champagne Brunch in June takes place this weekend, Sunday, June 30. Cost is $6.95 for adults, $1 for children 4 to 12 years old, and free for toddlers. Reservations recommended (265-6791).

DON'T MOW THE LAWN on July 4th. Instead, spend the day swimming and snacking at the C-Club's Independence Day celebration beginning at 11 a.m. A special patio buffet will be served from noon to 5 p.m., with hamburgers, BBQ ribs, steak, tacos, baked beans, and corn on the cob. D.J. Ron Casias will be on hand to help you dance or relax. For the kids, a 20" Huffy bicycle will be given away. Admission is free for members and $3 for non-member guests.

LET THOSE BOOTS SCOOT Friday, July 5, as the Isleta Poor Boys go on stage from 7 to 11 p.m. Menu selections include prime rib or poached halibut (two-for-one priced $16.95), pan-fried catfish ($9.95), chicken breast smothered in green chile ($7.95), and filet mignon ($9.95). Dinner is served from 6 to 9 p.m. Make reservations early.

BET AND BLUFF at the T-Bird Card Sharks' July meetings, Thursday, July 11, and Thursday, July 25. Meetings begin at 10 a.m. and end about 3 p.m.

Events Calendar

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

June 28 — "Martin Kravitz Presents," an evening of solo dance performed by Martin Kravitz; 8 p.m., Experimental Theatre, UNM Fine Arts Center, 277-4402.

June 28 — "Songs of the Heart," the Desert Chorale, music by Dvorak and Bartok; Sunshine Music Hall, 244-4011.

June 28-30 — New Mexico Arts & Crafts Fair, 30th annual summer festival of the arts, more than 200 New Mexico artists, food booths, continuous entertainment, youth exhibit, distinguished artist exhibit; 10 a.m.-10 p.m. Fri. & Sat., 10 a.m.-6 p.m. Sun.; State Fairgrounds, 884-9043.

June 28-July 28 — Exhibit, "Late Style," recent works by Charles Mattox, Enrique Montenegro, Lucy Lewis, Clinton Adams, Garo Antreasian, Beaumont Newhall, Ann Noggle, and Joe Herrera; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

June 28-Aug. 18 — Exhibit, "Treasures of the Tar Pits," ice-age fossils from the Rancho La Brea Tar Pits in Los Angeles, produced by the Natural History Museum of Los Angeles County, features complete skeletons of dire wolves, a coyote, a giant ground sloth, and a cast from the skeleton of a 9,000-year-old La Brea woman; 9 a.m.-5 p.m. daily, New Mexico Museum of Natural History, 841-8836.

June 28-Sept. 20 — Exhibit, "Impressions of Nature," features the work of F. G. Hochberg, co-founder of the Nature Printing Society and curator of Invertebrate Zoology at the Santa Barbara Museum of Natural History, images printed directly from natural subjects including plants, fish, and shellfish; 9 a.m.-5 p.m. daily, New Mexico Museum of Natural History, 841-8837.

June 29 — Daylily Show, 8th annual hemerocallis show; 2-6 p.m., Albuquerque Garden Center, free, 296-6020.

June 29 — Summerfest: Korean/Japanese Night, food, entertainment, exhibits, arts & crafts; 5-10 p.m., Civic Plaza, free, 768-3490.

June 30 — Sunday Jazz: Laney McDonald Trio and the Pete Amahl Quintet; 12:45-5 p.m., Rio Grande Zoo, 255-9798 or 843-7413.

June 30 — Music Festival, 3rd annual event to benefit Health Care for the Homeless, live music featuring Unclean Hands and Dr. Jazz, face painters, jugglers, food; 6:30-9:30 p.m. (zoo exhibits open until 8 p.m.); Rio Grande Zoo, 821-4583 or 842-6132.

July 1 — Monday Lecture Series: "Cooking Pots, Micaeceous," Felipe, Jicarilla Apache, Hispanic; 10 a.m., Indian Pueblo Cultural Center theater, 843-7270.

July 3 — Annual 4th of July Fireworks Display, sponsored by American Legion Post #13; gates open at 5:30 p.m., fireworks at 9 p.m.; UNM Stadium, 294-8452.

July 3 — Annual 4th of July Fireworks Display and Fiesta, sponsored by the Old Town Optimist Club; 4 p.m. pre-show entertainment and fiesta, special tribute to Desert Shield/Storm veterans, fireworks at 9 p.m.; State Fairgrounds, 298-6741.

July 4 — Spirit '91, sponsored by KGGM TV-13 and KAFB, largest fireworks display in the state, entertainment, homecoming celebration for Desert Shield/Storm military personnel; 3-10 p.m., KAFB Flight Line (Gibson Blvd.), free, 846-5991.

July 4-14 — Aztec Dancers, includes 80-ft. pole fliers and the Snake of Fire dance; call for times, Indian Pueblo Cultural Center, 843-7270.

July 6 — Summerfest: Eastern Indian/Middle Eastern Night, food, entertainment, arts & crafts, exhibits; 5-10 p.m., Civic Plaza, free, 768-3490.

July 6-7 — 9th Annual Arts & Crafts Fair, American Indian arts & crafts, dances, food, entertainment; 10 a.m.-4 p.m., Indian Pueblo Cultural Center, free, 843-7270.

July 6-7 — Civil War Weekend and Battle of Glorieta Reenactment, portrayal of living history and camp life in New Mexico during the Civil War; 9 a.m.-4 p.m., Old Cienega Village Museum (exit 271 off I-25 North), 344-3248.

July 7 — Sunday Jazz: World Beat Day, with Blue Cafe, Caribe, and Jackie Holmes & A Piece of the Action; 3-7 p.m., Oscar Huber Memorial Ballpark in Madrid, 255-9798.

July 12 — Zoo Music Series: the Frontiersmen with Hi Busse; 6:30-9:30 p.m., Rio Grande Zoo, 843-7413.

Take Note

The Enchantment Brass Classic drum and bugle corps competition, sponsored by the Albuquerque Concert Band, will be held July 10 at the Albuquerque Sports Stadium at 8 p.m. Approximately 25 to 30 New Mexico high school and college students are involved in drum corps activities. One group, the Casper Troopers, will give a free performance July 6 at Hardin Field at 7 p.m. They will also rehearse July 5, 6, and 7 at Hardin Field and other KAFB locations. Rehearsals are open to the public. Open auditions for brass players will be held during these rehearsals for students ages 14 to 21. Call 888-1501 for audition information. (A clinic for band directors and students will also be held July 11 from 9 a.m to noon at Milne Stadium.) Tickets for the Classic are $10 and are available from high school band directors, Baum's Music, and Luchetti Music. For more information, call Bruce Kroken on 294-1959.

* * *

Eldorado High School Class of 1981 will hold its 10-year reunion July 5, 6, and 7. For information, call 292-5301.

* * *

A new club, Thursday Singles, is being formed by Albuquerque community men and women with the hope that Sandia single people will help get the club started. Possible activities include meeting at a restaurant for dinner, quiet activities (such as board and computer games), parties, summer barbecues, committee meetings, and participating in community events. For information, call Jan Biefeld on 293-8906.

* * *

At its recent spring meeting, members of the Sandia Peak Ski Patrol elected Jim Sweet (2134) patrol leader for the 1991-92 season. Jim is a 14-year veteran of the Ski Patrol. The Patrol's 90 volunteers assist skiers at Sandia Peak Ski Area and run the annual Ski Swap at the State Fairgrounds, scheduled this year for the first weekend in November.

Favorite Old Photo

JUST AFTER World War I, my three great-uncles (from left) Maurice Barber, John Barber, and William Barber posed for this picture in Paris. William served in the American Ambulance Corps and was wounded at Verdun. He then worked at fund-raising for the ambulance corps. Rejected by the US Army because of his wounds, he enlisted in the French army and spent the rest of the war in an artillery unit. He received the Croix de Guerre and Medaille Militaire for his WWI service. In WWII, he served with the US Office of Strategic Services and later received the Legion of Honor for his work in the OSS and for promoting good relations between France and the US.

— John Lorenz (6253)