One of DOE's Highest Honors

Twelve Sandians Receive Awards for Weapon Program Contributions

DOE awards recognizing outstanding Sandia contributions to the US nuclear weapon program have been presented to 12 employees. The Weapon Recognition of Excellence Awards, among DOE's highest honors, were presented Nov. 14 and 15 by Brig. Gen. Paul Kavanaugh, DOE Deputy Assistant Secretary for Military Application.

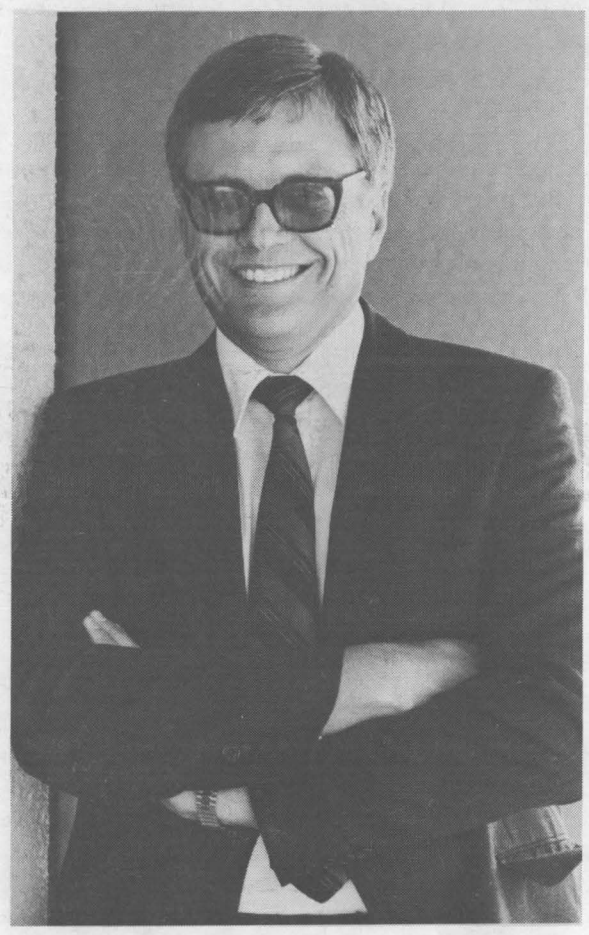
The two SNLL recipients were recognized for their achievements during a Nov. 14 ceremony in Livermore. The 10 SNLA recipients received their awards at a Nov. 15 ceremony in the TTC.

"Sandians receive many kinds of awards and honors, and we are proud of them all," says Executive Vice President Orval Jones (20). "But I view the annual Weapon Recognition of Excellence Awards as especially meaningful. They recognize the vital work Sandians do to develop and engineer safe and reliable nuclear weapons, and that's the core of our primary mission. My congratulations go to the 12 winners and to the other Sandians who are involved in their projects."

Some of the awards are for individual achievements, and some are for team efforts. The 1988 excellence award recipients are:

JIM POWELL (1230), *for leadership of the project team that led to the development of the Saturn X-ray simulator for above-ground testing of weapon systems.*

The Saturn X-ray simulator, largest in the free world, was designed to substantially improve Sandia's capability for above-ground testing (AGT) of nuclear weapon components and subsystems before final testing at the Nevada Test Site (NTS). Saturn became operational at Sandia in September 1987 on schedule and within budget. On its very first firing, it worked as planned, producing a radiation environment suitable for system testing.



JIM POWELL (1230)

Under development since 1983, Saturn offers a combination of high dose rate, short pulse, and fast rise time, giving a unique capability for AGT. In its first major use, weapon components were tested in November 1987, before the Mission Cyber underground test at NTS. Results of the Saturn tests predicted success at NTS, which was later confirmed. It has since been used to conduct numerous subsystem tests.

BRIG. GEN. PAUL KAVANAUGH, DOE Deputy Assistant Secretary for Military Application, presented the 1988 Weapon Recognition of Excellence Awards to Sandia's 12 recipients.

The uniformity of a high X-ray dose over an entire subsystem is much better in AGTs with Saturn than with older-technology simulators. Sandia has operated Saturn at 30 percent less cost than predicted, making it equal in operating cost to older machines having less than half its capability.

Jim says it's unfortunate there wasn't room for a hundred or more names on the plaque he received. "So many Sandians and contractors contributed to the development of Saturn. I accept the award not just for me, but for all those dedicated people."

ARNIE RIVENES (8132), *as representative of the team that fielded the Helicopter Accident-Resistant Container (HARC).*

Arnie and this team fielded the Helicopter Accident-Resistant Container in a very short time in response to a DoD request. The HARC provides increased protection against the scattering of nuclear materials should an accident (crash, fire, etc.) occur during transportation.

To meet DoD schedules, shipment of finished

(Continued on Page Three)

Mgmt. Briefing Story — Page Eleven

LAB NEWS

VOL. 40, NO. 24 SANDIA NATIONAL LABORATORIES DECEMBER 9, 1988

Basic Energy Sciences

Livermore and Albuquerque Researchers Win DOE Awards

An existing Sandia Albuquerque research effort and a new project proposed jointly by Sandia Livermore and Lawrence Livermore National Lab have been recognized by DOE's Division of Materials Sciences (part of the Office of Basic Energy Sciences).

Winning in the Materials Sciences Research Competition for 1988 was a team of seven Albuquerque Sandians and two collaborators outside Sandia. Led by David Emin (DMTS) of Solid State Theory Div. 1151, this research team received the award in the solid-state physics category designated "Significant Implication for DOE-Related Technologies."

Sharing the honor with David are Terry Aselage (1842), George Samara (1130), Bruno Morosin (1131), Dave Tallant (1823), Gene Venturini (1131), and Ann Campbell (1832). The two non-Sandia researchers are Charles Wood (Jet Propulsion Laboratory, Pasadena, Calif.) and Charles Beckel (Dept of Physics and Astronomy, UNM).

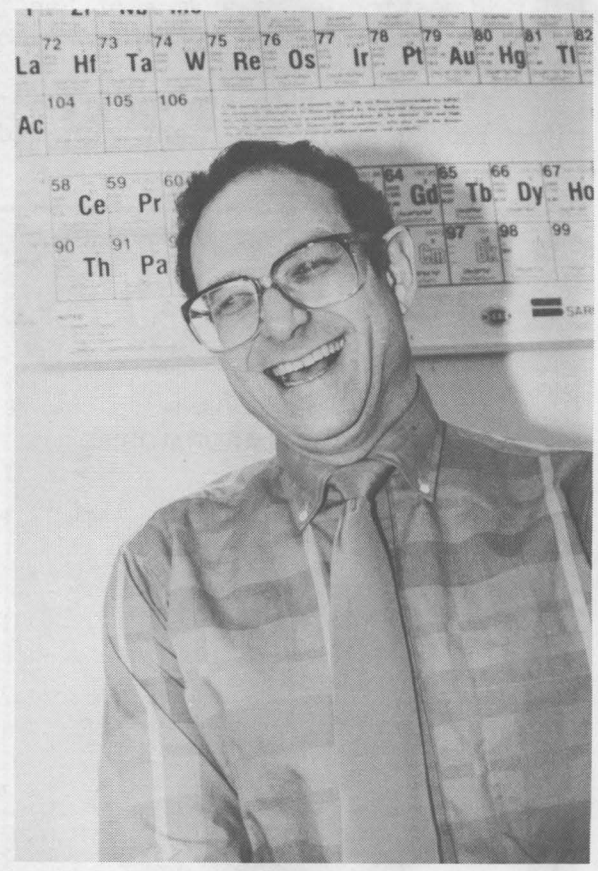
At Livermore, Mike Baskes (8341) and Wayne King (LLNL) submitted a successful proposal in the "New Initiatives" competition. That award brings partial funding of their project for at least three years (FY 90-92).

Joint Project

The winning research at SNLA is titled "Boron Carbides: Novel Refractory Materials as Very High Temperature Semiconductors." ("Refractory" means having a high melting point.)

Sandia's proposal for this research, a joint project of Solid State Sciences 1100 and Materials and Process Sciences 1800, won a "New Initiatives"

(Continued on Page Six)



GOOD NEWS for Mike Baskes (8341) and his Sandia Livermore and Lawrence Livermore colleagues: As a result of a successful "New Initiatives" proposal, funding is on the way for a research project on internal interfaces of materials. The first phase of the work will study niobium, element number 41 (symbol Nb) in the periodic table — above Mike's head and slightly to the left.

Antojitos

LAB NEWS's Predecessor -- It was an 8-1/2 x 11-inch mimeographed newsletter, and the Dec. 2, 1949, issue, at least, had two names, the "Sandia Weekly Bulletin" and "Sandia Seeds." With a front page covered by a Felix Padilla cartoon, it announced the Sandia Base children's Christmas party, noted the formation of a Sandia Corporation band, devoted a page to Sandia athletic events, and gossiped about various employees in each department (for example, "Walt Rosenburg is still managing to elude the clutches of that gorgeous airline hostess").

This particular issue, a 10-pager, also carried the name of Phil Nicovich in its "Welcome" column. Phil, who retired from Design Definition in 1986, recently discovered it in his files and donated it to LAB NEWS.

Yes, retirees and other mature folk, we'd love more. Except for this one, our Sandia Bulletin files begin with Vol. 2, No. 32 (December 1949). So we need any or all of Vol. 1 (1948) and the rest of Vol. 2.

* * *

Insight From Topside -- President Welber was reminded of this too-often-truth during the recent Management Briefing as Dennis Roth (3000) discussed the increasing costs of medical care: "Sick people don't shop, and well people don't care."

* * *

Nothing Wrong With Brevity -- except when it cancels out clarity. Some recent examples from the mailbag:

From the Employee Benefits Manual, "Sickness and Disability" section: "Job-incurred accident disability . . . begins after exhausting vacation . . ." Ah, aren't they though! (Thanks, 7842 engineers.)

From a TTC conference room sign: "PLEASE LEAVE THE CONFERENCE ROOM IN ORDER FOR THE NEXT MEETING." Sorta leaves you hanging -- and wondering whether you should get out as soon as you arrive, doesn't it? (Thanks, Paula McAllister, 1265.)

Then there's this sign on a door in Aisle D in Bldg. 880:

DO NOT USE
OTHER DOOR ONLY

And we wonder why the stress level at Sandia is so high. (Thanks, Bill Jacklin, 2643.)

* * *

Re: The Above -- As we've noted before in this space, misplaced modifiers have the potential for more raised eyebrows per paragraph than other forms of communication problems. This one comes from a textbook, for heaven's sake, on creativity in engineering: "Over 2000 electrical engineering students have, in various evolving forms, been exposed to this material." As Larry Bacon (1235) puts it, "Sounds like the people I went to school with."

And this one comes from a photo caption in the Coos Bay (Oreg.) World: "President Reagan points the way for the pope and his wife." (Thanks, Ayden Young, 2345.)

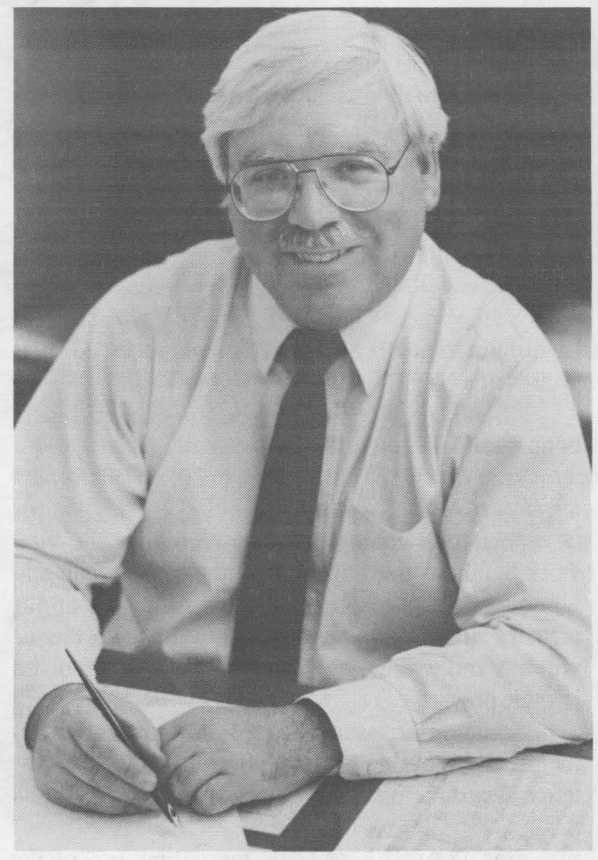
* * *

Question -- Is anyone at Sandia using anything but the traditional QWERTY typewriter or terminal keyboard? If so, call me on 4-1053. •BH

* * *

"I have yet to see any problem, however complicated, which, when you looked at it the right way, did not become still more complicated."
--Poul Anderson

Eagan Named Director 1800



Bob Eagan has been named director of Materials and Process Sciences Org. 1800, effective Oct. 16.

Bob joined the Labs in 1971 as a staff member in the Materials organization. He was promoted to supervisor of the Ceramics Development Division in 1977, and to manager of Chemistry and Ceramics Dept. 1840 in 1983. In 1987, he transferred to Integrated Circuit Technology Dept. 2140 as acting manager.

"We will continue the excellent research programs developed during Dick Schwoebel's tenure and will expand and improve interactions with our many customers," Bob says. "I expect this to be a challenging and rewarding experience." (Dick recently became Director of Components 2500.)

Bob has a BS in ceramic engineering from Alfred University (Alfred, N.Y.) and an MS and PhD in the same field from the University of Illinois. He's treasurer of the American Ceramic Society, president of the Ceramic Education Council, and is on the editorial advisory board of the Materials Research Society.

In his spare time, Bob is a woodworker; he also enjoys traveling with his wife Judith. They live in Cedar Crest.

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LAST OFFICIAL VISIT — Lt. Gen. James Abrahamson, Director of the Strategic Defense Initiative Office (SDIO), visited Sandia Nov. 22 for discussions and tours of SDI research facilities. Here, he expresses his appreciation for the Labs' SDI work during a reception in his honor, which was attended by Sandia SDI workers and officials. Gen. Abrahamson is scheduled to retire from the USAF Feb. 1. Listening are (from left) Roger Hagengruber (9000), Orval Jones (20), and Venky Narayanamurti (1000).

(Continued from Page One)

Weapon Awards

units began less than three months after the request. The container design was based on earlier work by the Labs in 1970.

The HARC consists of a thick inner aluminum container surrounded by a redwood liner and stainless-steel outer hull, weighing about 2000 pounds when empty. It's about 6 feet long, 4-1/2 feet wide, and 3-1/2 feet high. The Sandia team also designed a special shipping adapter, which fits inside the container, for specific hardware that needed to be shipped.

Extensive testing was conducted to prove the adequacy of construction and compatibility of the container and hardware. The work in 1970 determined the capabilities of container construction when subjected to explosives, impacts, and fire accidents.

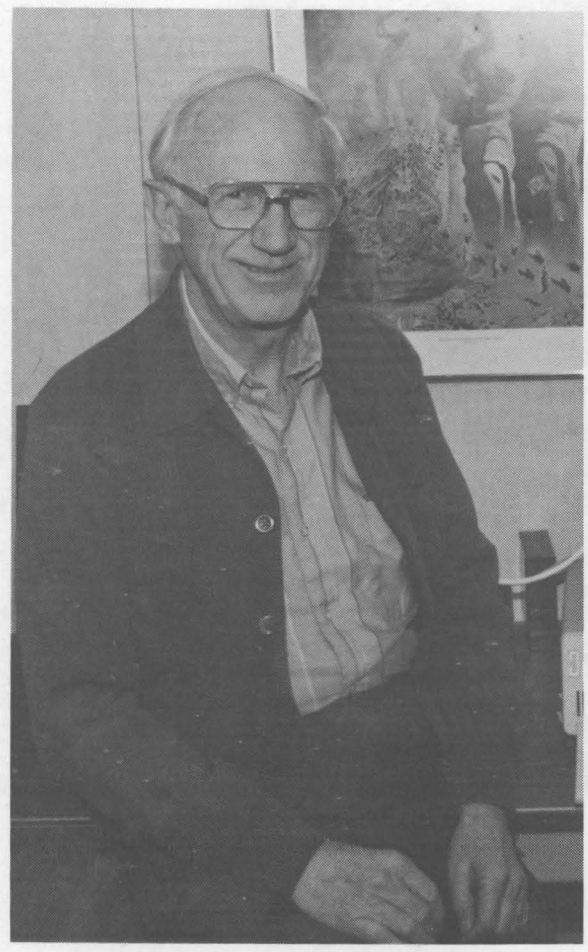
After developing use procedures, Sandia military liaison groups helped train military personnel to use HARC. Assistance from a Sandia test assembly group and other employees who were responsible for drafting, fabrication, plastics, painting, and purchasing played an important part in meeting the DoD schedule.

"The HARC effort was a good example of our 'can-do' spirit when a critical need must be met in a short time," Arnie commented. "I'm particularly pleased with the team effort and the excellent cooperation among the Sandia groups, here at Livermore and in Albuquerque. We can all be proud of these kinds of efforts and results."

VON MADSEN (8445), *for significant contributions to the nuclear weapons program in the area of soft functional gaging on coordinate-measuring machines*. (For work performed as part of a seven-person team at the Oak Ridge Y-12 plant.)

Von, along with members of a Y-12 project team at Oak Ridge, conceived, developed, and implemented a systematic approach to part certification known as "soft functional gaging." The approach applies the principles of hard gaging to coordinate-measuring-machine (CMM) certification of manufactured parts. The Y-12 plant produces components for nuclear weapons.

The traditional approach at Y-12 to ensure compliance with the required dimensioning standard has been to design, fabricate, and use hard functional gages. However, this approach is costly, requires long lead times, and does not provide quantitative process control information.



VON MADSEN (8445)

Coordinate measuring machines coupled with computers have provided new capabilities for manufacturing-quality-control, but CMM data analysis software for certifying parts has been insufficient for determining the acceptability of certain parts with small design tolerances. Von and the Y-12 team worked closely with CMM vendors to design and produce much-improved software and then evaluated it thoroughly.

This new technology was first implemented in FY87 on the W84 weapon program. The W82 and W88 programs will use the technology extensively, negating much of the need for hard gages. The new technology is being shared with other DOE nuclear weapon contractors.

Von says, "Back in the early and mid-70s, Tom Conlon, Bill Thomas [both ret.], and several other Sandians developed a system that showed data from a measuring machine could be manipulated in a computer program to indicate functional acceptability of measured parts.

"Since CMMs we use now weren't available back then, their system was perhaps ahead of its time," he continues. "The soft gaging system at Y-12 uses a different approach to solve the problem, but the underlying concept is similar."

PAUL YARRINGTON, BILL DAVEY, and ARCHIE FARNSWORTH (all 1533), *for comparative analyses of nuclear weapon effects from near-surface and buried explosions*.

Paul, Bill, and Archie together have produced systematic and detailed analyses of ground shock in various target geologies for a range of near-surface and earth-penetrating nuclear weapons. This information is considered crucial for the development of effective weapon systems and rational targeting strategies.

The Limited Test Ban Treaty precludes atmospheric and near-surface nuclear explosion tests.

(Continued on Next Page)

Congratulations

To Juanita Mansfield (8233) and Paul Benson, married in Livermore, Oct. 15.

To Annette Talley-Bailey and Gary Bailey (8244), a son, Dylan Pwyll, Oct. 18.

To Mary Mandia (8343) and Fred Johnson (8284), married in Sunol, Oct. 22.

To Teresa (8442) and Arlyn (8341) Antolak, a son, Brandyn Joseph, Oct. 27.

To Susan (8317) and Tom Crawford, a son, Jordan, Nov. 14.

SANDIA LIVERMORE NEWS
VOL. 40, NO. 24 DECEMBER 9, 1988

LEAP Sets Two Records

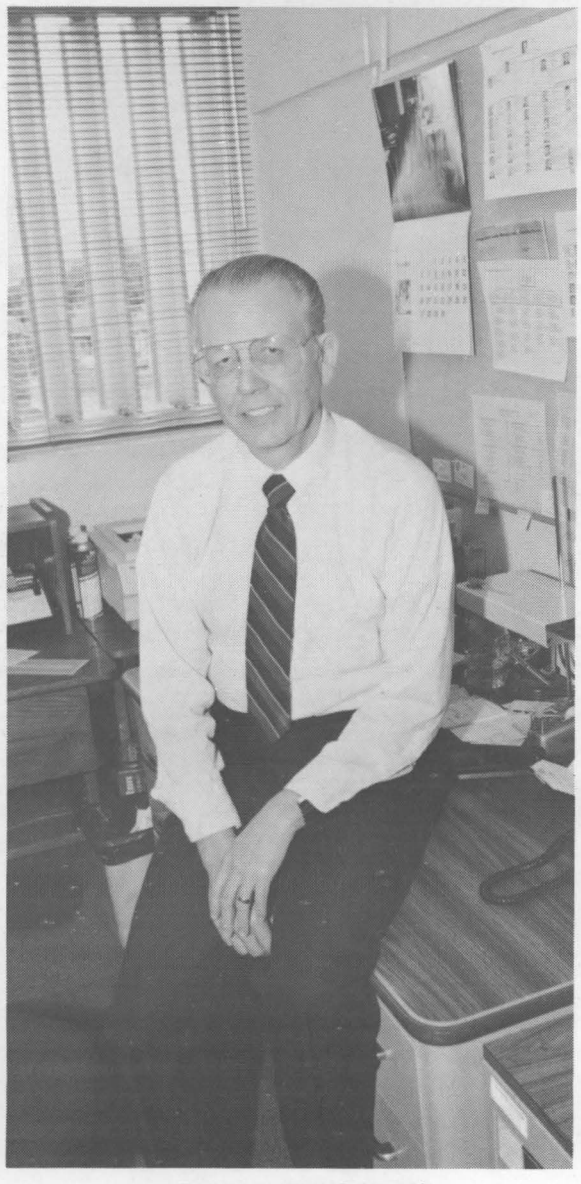
Many nonprofit agencies and local charitable groups will be happier this holiday season, thanks to the generosity of Sandians who pledged $151,485 during the LEAP '88 campaign this fall.

The Livermore Employees Assistance Plan drive resulted in two new records for Sandia Livermore: the highest dollar amount ever raised ($6000 above the goal), and the greatest average pledge per participating employee ($174.32).

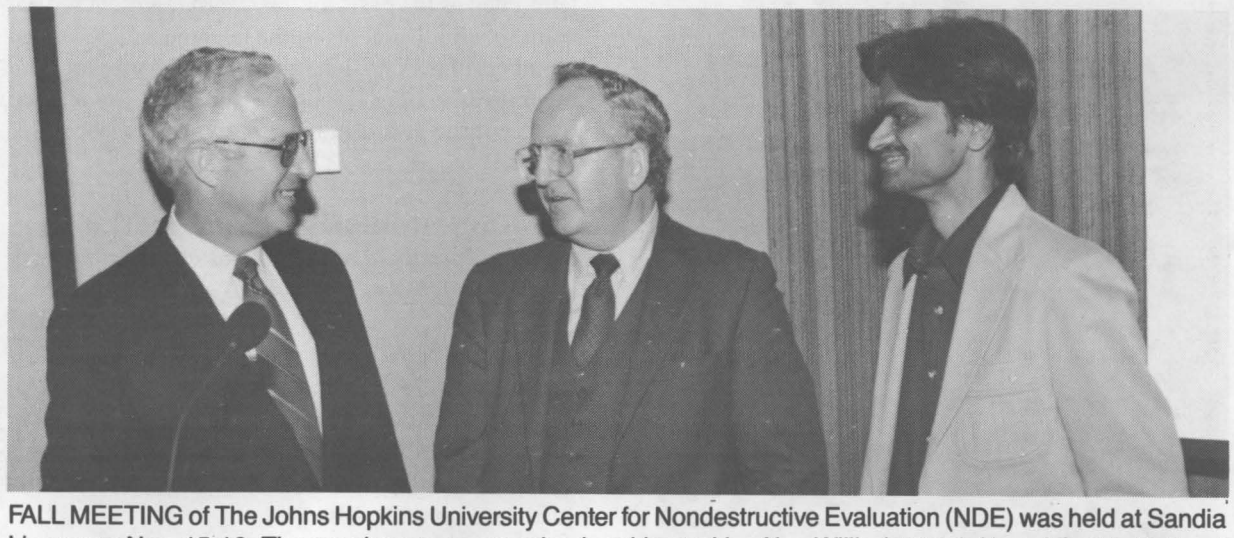
A very pleased LEAP chairman, Louie Tallerico (8284), thanked the 869 employees who responded to the committee's efforts to meet the 1988 goal: "I'm grateful to all my committee members, to those who helped on the LEAP Faire/Circus, and to everyone who pledged. Together, we've made this the most successful year ever for us."

Statistically, 869 people (80.9 percent of Sandia Livermore's employees) gave to LEAP this time, and 289 employees (26.9 percent) pledged a Fair Share of one hour's pay per month or more. Those figures were down slightly from 1987, but the overall dollar totals were higher.

Surpassing the goal means that the 30 local-area nonprofit human service groups chosen for support will fare even better than anticipated in their shares of the fund-raising campaign, an employee-run program that began in 1969 at SNLL.

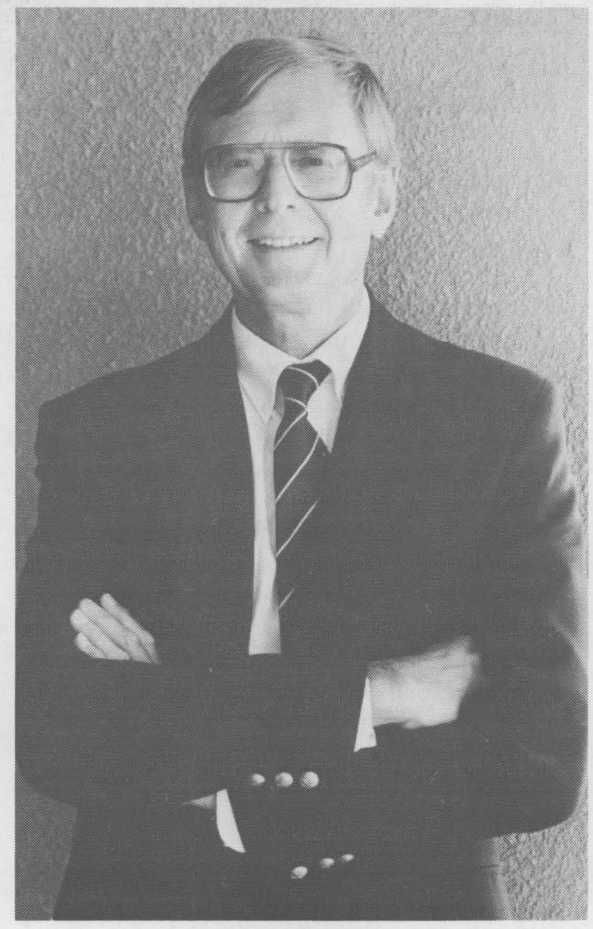


ARNIE RIVENES (8132)



FALL MEETING of The Johns Hopkins University Center for Nondestructive Evaluation (NDE) was held at Sandia Livermore Nov. 15-16. The sessions were organized and hosted by Alec Willis (8317, left) and Satish Kulkarni of LLNL (right). Between them is Robert Green, Director of the Center. The meeting was attended by Johns Hopkins University faculty and Center staff, industrial and government members of the Center, and representatives of the DOE labs and production plants. The sessions included technical presentations and tours of Sandia and LLNL NDE facilities, the Combustion Research Facility, and LLNL's Nova facility.

PAUL YARRINGTON (left), Archie Farnsworth (center), and Bill Davey (all 1533)



JOHN ANDERSEN (DMTS, 5161)

(Continued from Preceding Page)

Weapon Awards

Therefore, no test data are directly available to support estimates of ground motion produced by modern nuclear weapons exploded at the earth's surface or slightly above or below it. As a result, it has been difficult to establish the capability of nuclear weapons to destroy hardened military targets above or below the surface.

The team of Bill, Paul, and Archie has pioneered use of multidimensional radiation hydrocodes to establish these weapon capabilities. Their calculations follow the energy-coupling processes from the beginning of radiative output to the ground-shock effects that occur at the outer limits of a weapon's lethal range.

Several major conclusions have resulted from their work. They have shown there is very little difference in the effectiveness of nuclear weapons exploded a few metres above the ground from those exploded on the ground. Their calculations also disclosed that moderate-yield, earth-penetrating weapons are much more effective than previously thought for destroying extremely hard underground targets.

''This effort is one example of calculational work done at Sandia made possible by the supercomputing capabilities now available,'' Paul says. ''Not many years ago, a study such as this would have been prohibitively expensive in terms of computer time required. New weapon-effects issues now emerging, such as the utility of multiple-synchronized bursts for certain targets, will likely require further increases in our computing resources.''

MIKE HECK (2334)

MIKE HECK (2334), *for outstanding contributions to the development of inertial measurement systems for nuclear weapons*.

Mike was recognized for multiple contributions during more than 20 years of development work on guidance and control systems and fuzing devices. In the early 70s, he led the development of a two-axis stable platform for Sandia exploratory systems programs. This effort established Sandia's capability in small, high-G inertial systems and provided the basis for all subsequent Sandia inertial measurement unit (IMU) designs.

He contributed to the development of the Roll-stabilized Inertial Measurement System (RIMS) — a unique Sandia contribution to inertial navigation systems — that was flown on exploratory systems experiments in 1981-82. He also led IMU development efforts for the TIGER extended-range bomb demonstration program and applied inertial sensor technology to the B77 Modern Strategic Bomb roll-control system.

Recently, Mike's division developed the miniaturized IMU system, or Mini-RIMS. It provides navigational capability for future weapons systems, such as earth-penetrating warheads.

Inertial navigation technology has produced a Sandia capability for nuclear weapon fuzes based on path length to the target. This technology has been applied in the force-balance integrating accelerometer used in the Trident II weapon system. The accelerometer is the first precision radiation-hardened inertial subsystem for the stockpile. The program has been conducted under Mike's technical direction and supervision.

Mike says, ''The developments in inertial systems cited as the basis for this award represent project team accomplishments by the talented and dedicated members of my division, with excellent support from other organizations throughout the Labs. I'm pleased to accept the award in recognition of their achievements.''

JOHN ANDERSEN (DMTS, 5161), *for outstanding contributions to formulation of weapon conceptual designs and engineering feasibility*.

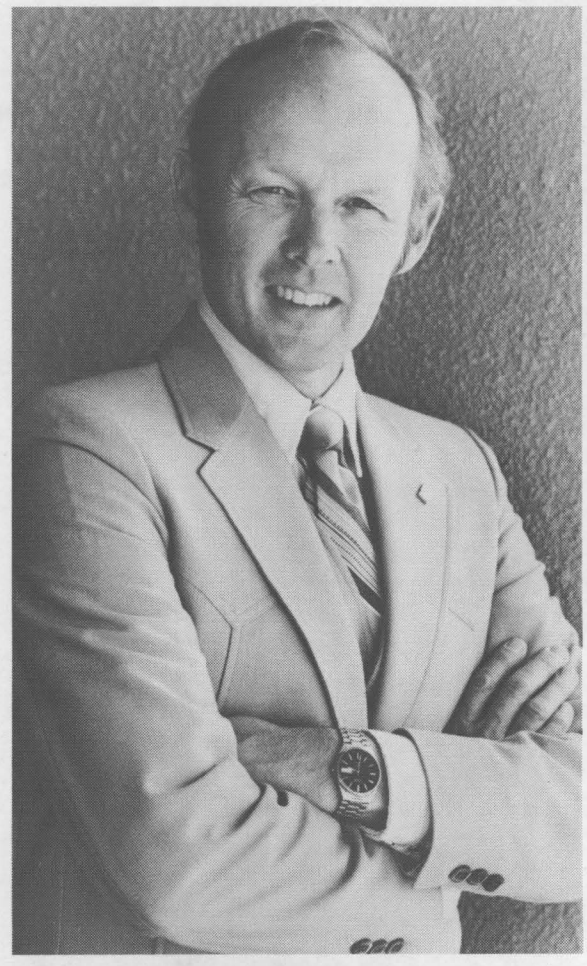
John has conceived new designs and adapted them to emerging military needs. His recent contributions include the design, analysis, and testing of an earth-penetrator weapon for targets in hard rock; this work established the technical feasibility of a hard-rock penetrator and led to successful tests of a full-sized point design.

In other recent projects, John produced conceptual weapon system designs for a new tactical air-to-surface missile (TASM) and a new follow-on to Lance (FOTL) tactical Army missile. He has also produced proposals for the short-range attack missile (SRAM) II.

John designed several different missile and warhead combinations for the TASM to determine sensitivity of the desired requirements to design characteristics. This work established the technical feasibility for a TASM that could meet the Air Force's proposed requirements, which eventually led to an approved statement of need for the missile.

In a major study conducted by DoD's Strategic and Theater Nuclear Warfare Office, John assessed the feasibility and impact of using a common solution for two different proposed missile systems. Also, he conducted an aircraft compatibility and impact evaluation for another application within the overall study.

John says, ''I work for and with some very good people. Although the award focuses on an individual, the results are very much to the credit of a small, dedicated team of people who place no limitations on their contributions.''



BOB COVER (DMTS, 5215), *for outstanding contributions to the development and implementation of technology for the DOE Security Communications System (SECOM)*.

Developed for the DOE Weapons Transporta-

(Continued on Next Page)

(Continued from Preceding Page)

Weapon Awards

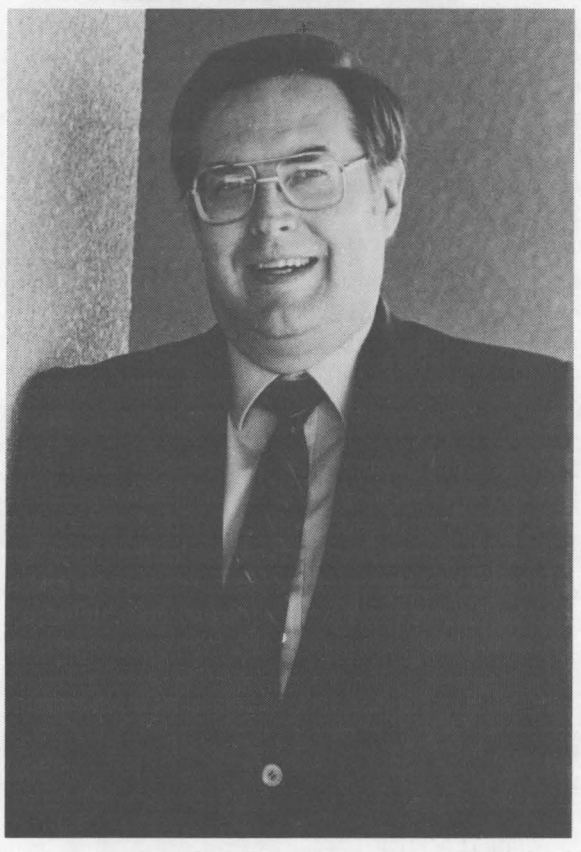
tion System, SECOM provides a command and control link between individual vehicles in the nuclear weapons transportation fleet and the DOE control center in Albuquerque. SECOM provides constant contact with convoys and aids the center in evaluating actions that may occur during nuclear weapon transport.

Operated by DOE/AL, the system consists of five high-frequency transmitter sites in the continental US and matching radio systems in the vehicles, a main control center, and an alternate control center.

The control system communicates with the vehicles through a network of 14 computers. Convoy position is overlaid onto interactive graphics map displays. Six other computers are used for support functions. The technically sophisticated network can process classified and unclassified information simultaneously.

Bob, who has been involved with the project since its inception in 1974, was recognized for his leadership and technical guidance on all aspects of the SECOM computer system. He was also responsible for designing the modernized control-room facility that DOE/AL is now using. Bob guided a team of Sandians and contractors who designed the system with several special computer interfaces and wrote the software for the 20 computers.

"It has been a pleasure to work with a group of real professionals on this project," Bob says. "The continuing encouragement from Sandia and DOE management to constantly review new technology for possible enhancement of the system makes the project work exciting."



JOHN PORTLOCK (7234), *for significant and continuous contributions to the nuclear weapons program in the area of command and control.*

John was the component project engineer for developing the multiple-code coded switch (MCCS) used in two categories of permissive action links (PALs). PALs are command/control devices that permit the authorized use of a nuclear weapon only when directed by National Command Authorities and thus prevent or delay unauthorized use.

Used since the mid-70s, the MCCS has provided significant features that enhance the control of nuclear weapons and provide additional flexibility to the National Command Authorities.

In the late 70s and early 80s, John led the weapon development organization's command and control efforts. During this time, development began on a new-generation PAL switch that allows significant enhancement of the code-handling system. The switch is now being incorporated in the design of new weapons.

John has also contributed to the design and fielding of PAL control equipment and has been involved in command and control studies at the national level. He currently supervises Sandia efforts devoted to adversary analysis of command and control systems. The goal is to identify design vulnerabilities, if any, early in development programs, so timely and cost-effective design changes can be made.

BOB COURTNEY (7234, left) and Larry Harrah (ret.)

"It's a great honor to be in the company of the other recipients of this award," says John. "I'll remember the occasion for a long time, but I'll always remember my co-workers who have given me support, inspiration, encouragement, and — most importantly — their friendship for nearly two decades."

BOB COURTNEY (7234) and LARRY HARRAH (ret.), *for development of irreversible getters for hydrogen, moisture, and other reactive gases.* (For work performed as members of a team, nominated by Los Alamos National Lab [LANL]; other team members are from LANL, Allied-Signal [formerly Bendix], and Oak Ridge National Lab).

Many modern nuclear weapons remain in the stockpile a long time — some for 25 years or more. The safety, reliability, and longevity of these weapons are ensured by various design features, including "getters."

When plastic parts or organic materials stay inside a sealed container for extended periods, hydrogen and moisture can be released. The end result can be embrittled metals and/or damaged electrical and optical components. Getters absorb the corrosive (and potentially explosive) gases and moisture that can produce oxides and possibly cause malfunctions.

The hydrogen getter was invented by Bob, Larry, and Richard Anderson (6334) in 1974.

"Hydrogen getters were first used in nuclear weapons in the late 70s," Bob says. "It was the first time an unsaturated organic catalyst combination was used to irreversibly getter [remove] hydrogen from closed systems via a chemical reaction. Passive getters are used extensively in nuclear weapons today."

In the past decade, Sandia and LANL have worked together to develop and engineer improved hydrogen getters and to develop other irreversible getters that react chemically with additional gases and moisture. The weapons labs have worked closely with integrated contractors — Allied-Signal Aerospace in Kansas City and the Oak Ridge Y-12 plant — in these efforts.

The combined efforts have resulted in significant improvements in stockpile confidence, reliability, and lifetime. ●LP

Winners of Prior Excellence Awards

1982 Jack Marron (2532), Jim Craig (ret.), Dick Damerow (2561), Ed Kjeldgaard (6321), Dick Brodie (5100), Harold Vaughn (ret.), Al Hodapp (DMTS, 1551), Bob Thompson (1420), Larry Bertholf (2600), Ruth Whan (1820), Tom Massis (2515), Don Sharp (1841), and Fred Villa (2544).

1983 Stan Spray (7232), Bob Graham (DMTS, 1131), Dan Tichenor (8441), Ken Henry (8444), Wilbur Jorgenson (8434), Tom Martin (1250), Ken Prestwich (1240), and Bill Chambers (1822).

1984 Vic Roh (ret.), Peter Rand (1813), Rod Quinn, Jim Searcy (2523), Arlen Baldwin (2523), Jim Jorgensen (2181), Wayne Corbett (2116), Won Kim, Keith Treece (DMTS, 2115), Tom Mnich, Rich Anderson (2142), Doug Weaver (2130), Ron Light (2131), Terry Nordstrom, Fred Sexton (2147), Frank Nielsen (dec.), Bill Sundt (ret.), Ed Williams (DMTS, 8153), Curt Franklin (ret.), and Russ Miller (8155).

1985 Bill Stevens (ret.), Bob Luna (6321), Paul Longmire (2360), Steve Burchett (1521), Gordon Boettcher (DMTS, 2565), Cook Story (8165), and Morris Mote (ret.).

1986 Gus Simmons (Senior Fellow, 200), Bob Moyer (DMTS, 7242), Ray Alls (2341), Walt Dalby (5115), John Sharp (2825), Randy Harrison (2811), Ben Benedetti (8241), Dick Jorgensen (5113), and Don McCoy (5111).

1987 Carl Peterson (1550), Randy Maydew (400), Don Johnson (DMTS, 1552), Hal Widdows (1552), Chuck Williams (2344), Andy Lieber (5220), Ted Schmidt (6450), Herman Mauney (7200), Jay Gilson (8130), Wayne Young (9122).

COORDINATING THE NUCLEAR DEFENSE efforts of the US and the United Kingdom brings British visitors to Sandia approximately every year. Behind the US and UK flags are (from left) Michael Steeden, Head of the Atomic Coordinating Office at the British Embassy in Washington; Robert Ridley, Assistant Chief Scientific Advisor, Nuclear, to the Ministry of Defence (MOD); Norman Oxburgh, Chief Scientific Advisor to the MOD; Irwin Welber (1); and Thomas McLean, Director of the Atomic Weapons Establishment, Aldermaston. This was the first visit to Sandia by Oxburgh, who recently assumed his position. The visitors were briefed by Irwin and Small Staff members; they also toured Area IV and the Technical On-Site Inspection (TOSI) facility.

(Continued from Page One)

BES Awards

grant for FY88-90 (LAB NEWS, Aug. 15, 1986).

Dick Schwoebel, formerly Director of 1800 (now Director of Components 2500) says, "I was pleased to hear of the award for this impressive research effort. The winners fully deserve it, individually and collectively. It's a fine example of excellent theoretical work in 1100 being coupled with equally impressive experimental work in 1800."

The boron-rich materials being studied in this project might be used for direct conversion of heat to electricity, or as semiconductors that could function in hostile environments, such as within turbines or nuclear reactors.

The research so far has focused on boron carbides. They belong to a class of materials with unusual chemical and physical properties. The Sandia team has cleared up some long-standing mysteries about why the materials behave contrary to expectations.

For instance, boron carbide (a chemical combination of boron and carbon) is so hard that it is used for armor. It is nearly as hard as diamond — actually harder at high temperatures. Hard materials normally conduct heat well, David Emin says — but boron carbide is a thermal insulator.

Another peculiarity is that the carbon in boron carbide can make up anywhere between 8 and 20 percent of the material. As a contrast, David cites sodium chloride (table salt), in which the ratio of atoms is fixed to within billionths of a percent.

These oddities, and others, arise from a peculiar structure. Boron carbide is based on groups of twelve boron atoms, forming the vertices of a 20-sided shape called an icosahedron; between some of the icosahedra are three-atom chains of boron and carbon.

The ratio of boron and carbon is so variable because the atoms can exchange roles. "They masquerade for one another," says David. "Boron can take an extra electron and act like carbon. Carbon can give up an electron and act like boron."

Working out such structural details is a major advance credited to the Sandia researchers and their collaborators. "It has long been known — maybe for 50 years — that boron carbides have an icosahedral structure," says David. "But no one had distinguished where the carbon and boron sat — that is, which atom went where, and why."

Some Like It Hot

David describes another atypical property of boron carbide, this one associated with thermoelectricity, the ability to produce electricity from heat.

"SIGNIFICANT IMPLICATIONS for DOE-Related Technologies," say the certificates, awarded for research in boron compounds as high-temperature semiconductors. Displaying them are (from left) Gene Venturini (1131), Dave Tallant (1823), Ann Campbell (1832), Terry Aselage (1842), Bruno Morosin (1131), David Emin (DMTS, 1151), George Samara (1130), and Fred Vook (1100).

Instead of having an efficiency that peaks at a few hundred degrees Celsius like that of standard thermoelectrics, boron carbide becomes more and more efficient as high as measurements have been made. That's up to well over a thousand degrees, a temperature typical of nuclear reactor cores, which thus might be a feasible heat source.

"Current approaches to thermoelectrics," says David, "require shielding the thermoelectric material, keeping it cooler than the reactor. That wastes energy. With boron carbide, the higher you operate, the better the efficiency."

David describes thermoelectricity as "the most immediate application" of boron-rich materials. But he wants to go further: "For me, the idea of high-temperature electronics — opening up a new field — is even more exciting."

High-temperature semiconductors would probably use a compound of boron and either phosphorus or arsenic, plus a dopant such as sulfur or silicon to give the material the necessary semiconductor properties. Electronics made from such materials would have a melting temperature perhaps a thousand degrees higher than that of the usual semiconductor material, silicon — high enough for operation inside nuclear reactors or other hot places.

(A neutron-absorbing isotope of boron is currently used in nuclear-reactor control rods, but a different isotope — not a neutron absorber — would be used for the semiconductors.)

Creating semiconductors requires consistent production of high-quality materials. "A lot of boron carbide has been used in the past for armor and control rods," David explains. "But these are not very sophisticated uses. For armor, you don't care if the crystals are pure semiconductor-grade material. We care."

That's where Terry Aselage and his lab come in. Although the specialty of each person named in the award is important, right now David describes Terry's work in producing well-characterized materials as "crucial."

Terry explains that, for boron carbide, a hot-pressing technique has been developed to yield samples that do not have free carbon or other impurities. And single crystals have also been grown for making experimental measurements.

Measurements on the purest samples confirm that the properties observed earlier are intrinsic to boron carbide. They are not caused by, for instance, some impurity in the sample.

For the boron compounds with arsenic and phosphorus, Terry says, work is in the early stages. There is little previous research to build on. But some small single crystals have been grown in Terry's lab, and larger crystals will be produced with recently acquired equipment, paid for mainly with funds provided by the original grant.

Other Contributions

Other recipients of the award have been doing their parts: George Samara studied pressure dependence of the electrical conductivity; Bruno Morosin measured lattice constants of boron-rich solids; Dave Tallant made extensive studies of the Raman spectra of boron-rich solids; Gene Venturini measured the electron-spin resonance of defects in boron carbides; and Ann Campbell investigated the microstructure of boron carbide films produced by chemical-vapor deposition (CVD).

David is proud of the team's accomplishments. They thoroughly test each idea, he says. "It's been two steps forward and one back, but when we've presented our results, we've done so much work that no one has really contested them."

He notes that other people at Sandia and elsewhere are working on boron. But he's especially pleased that his group, supported only for the past couple of years by a DOE new-initiatives grant, has come so far so fast.

"In this competition, we're the new kid on the block," says Dave. "The award speaks well of how we compare."

Livermore Winners

In the award notification to this year's winners at Livermore, Iran Thomas, Director of the Division of Materials Sciences in DOE's Office of Basic Energy Sciences, said that "the competition was extremely keen." He characterized the winners (a total of three among 19 entries) as those "most likely to achieve the objectives set out for our new initia-

(Continued on Next Page)

Basic Facts

Why BES Sponsors the Competitions

The purpose of the Materials Science Research Competition "is to provide DOE recognition to individual laboratory scientists who have conducted outstanding research," according to Iran Thomas, Director, Division of Materials Sciences, Office of Basic Energy Sciences (BES).

Categories for the BES awards are metallurgy and ceramics, solid-state physics, and materials chemistry. Three awards are given in each category, for Outstanding Scientific Accomplishment, Sustained Outstanding Research, and Significant Implication for DOE-Related Technologies.

Winners for 1988 are Sandia Albuquerque, Lawrence Livermore, the University of Illinois, Ames, Brookhaven, Lawrence Berkeley, Oak Ridge, and Argonne.

Award Significance

The significance of this award, according to Thomas, is primarily the recognition by DOE that the winners have made outstanding research contributions. In addition, each award this year brings about $40,000 to be used for purchasing research equipment.

The "New Initiatives" competition, on the other hand, is primarily for recognizing and funding projects that seem likely to produce important research results in the future. This competition is open to national laboratories and university contractors involved in materials research funded by the Office of Basic Energy Sciences.

The objective, says Thomas, is "to uncover new understanding in the science of materials." The announcement for the next year's competition emphasizes that proposals should avoid minor extensions of current work, focusing instead on truly important new scientific or technological issues.

Besides the joint project of Sandia Livermore and Lawrence Livermore, other winners this year are Argonne and the University of Illinois.

Both competitions are described by Thomas as helping to emphasize that DOE encourages high-quality, innovative research.

(Continued from Preceding Page)

tives program, namely, to uncover new understanding in the science of materials with high-quality, innovative, and multidisciplinary materials research.''

The research effort that Mike and Wayne proposed is titled ''The Effect of Impurities, Flaws, and Inclusions on Adhesion and Bonding at Internal Interfaces.''

The concept behind the proposal, explains Mike, is ''to take two perfect crystals and fuse them together in a way that they don't exactly fit, and thus form a boundary in between.

''The boundary between the crystals represents a grain boundary in materials. Because boundaries determine many mechanical properties, we are trying to understand boundary failure mechanisms at the most basic level.''

Mike, Wayne, and Jim Adams (a post-doc in 8341) plan to investigate issues such as how types and amounts of impurities alter the structure of an interface; how the impurities affect the properties of the material; and how impurities, flaws, and other foreign bodies alter the adhesive energy of the interface.

EAM Allows Atom Study

To put the concept into practice, LLNL will construct a bicrystal fabrication facility, produce the fused bicrystals, and make measurements such as the fracture strength and the diffusion rates along boundaries.

Sandia will, in parallel, first make calculations to determine where the atoms in the boundary area are located. For these calculations, Mike and his colleagues will use the embedded-atom method (EAM) developed earlier at SNLL as a way of investigating the atomic behavior of metals.

EAM allows calculations that consider individual atoms, not just macroscopic features as in earlier models. It depicts a metal as an ordered lattice of atomic nuclei, plus electrons in varying densities at different points. Because the method can apply to alloys or impurities in addition to pure metals, it enables fundamental study of technologically significant materials. EAM was a winner in the 1987 Materials Sciences Research Competition (LAB NEWS, Nov. 6, 1987).

The Sandians will calculate the same quantities measured by LLNL — diffusion rates and fracture strength. They hope that experiments and calculations will agree, each strengthening the validity of the other.

Sandia has a parallel DOE-funded program under which George Thomas (8341) and Mike Mills (8314) will use the new high-resolution electron microscope to determine the positions of atoms at these interfaces.

Only Two in the World

Only one other facility in the world—the Max Planck Institut in Stuttgart, Germany—studies bicrystals.

''It is especially gratifying to me that the power of the embedded-atom method has been recognized by our sponsors to be an important predictive tool in materials science,'' says Peter Mattern, Director of Combustion and Applied Research 8300.

''The application to the mechanical properties of crystals could eventually be of real practical significance. In addition, this cooperative endeavor with LLNL provides another opportunity to strengthen our ties with our colleagues across the street.''

The first crystals produced by LLNL will be composed of the element niobium, for which techniques of crystal fabrication have already been established. To produce bicrystals from single crystals, the experimentalists plan to use the diffusion bonding approach.

LLNL will prepare niobium crystals, assess their perfection with X-ray diffraction, produce flat surfaces suitable for bonding, purify the surfaces in a high-vacuum environment, and then align and bond the surfaces to produce the bicrystals. At the bicrystal interface, flaws and foreign matter will be carefully introduced with microlithography (to make flaws) and evaporation (to fill the flaws and create inclusions).

Mike and his Sandia associates will use the Cray supercomputer to perform calculations on the structure and behavior of interfaces identical to those produced at LLNL.

Although niobium itself does not have immediate practical applications, the combination of experiment and theory could lead to work on issues important to the weapon program — for instance, embrittlement of steel by hydrogen and helium. After the initial three-year funding, says Mike, the program could continue, depending on the success and knowledge gained in the initial phases. •CS/BLS

Four-Year Totals

Vook on the Record

After four years of the Materials Sciences Research Competition, Sandia has won nine of 35 awards, reports Fred Vook, Director of Solid State Sciences 1100. The next-highest total is six.

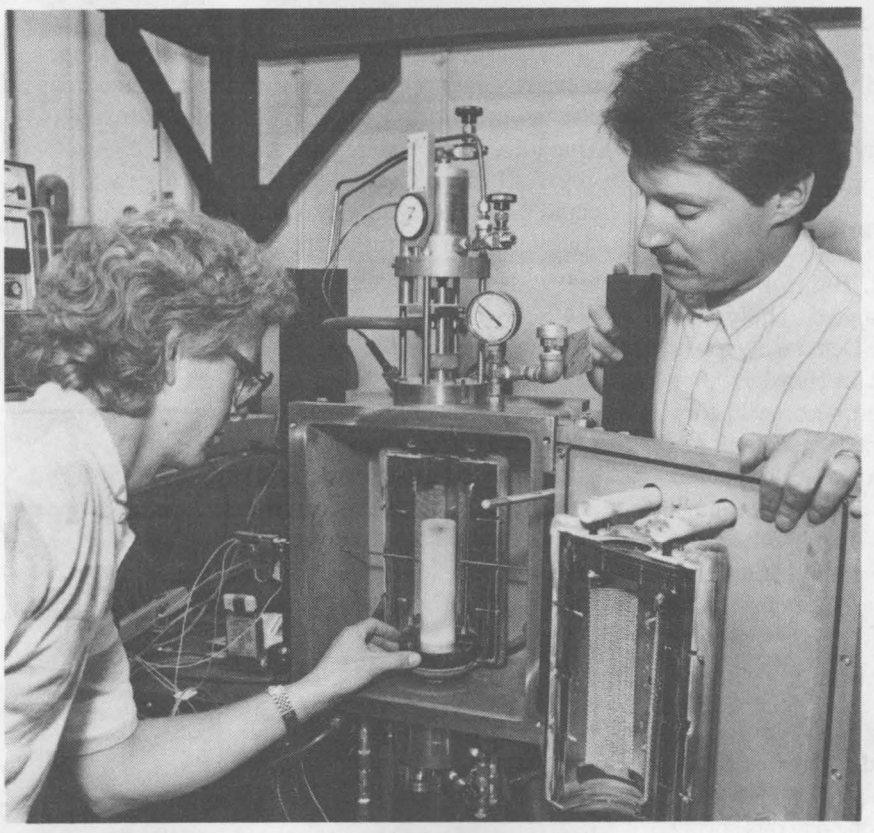
And after four years of ''New Initiative'' awards, Sandia has won three. Next highest is two awards, which three other labs have achieved.

''This record shows Sandia excelling on two fronts,'' says Fred. ''The Materials Sciences Research Competition is for research accomplishments judged by peers — technical persons chosen from the labs. The 'New Initiative' awards are determined by DOE Headquarters for proposed new research.''

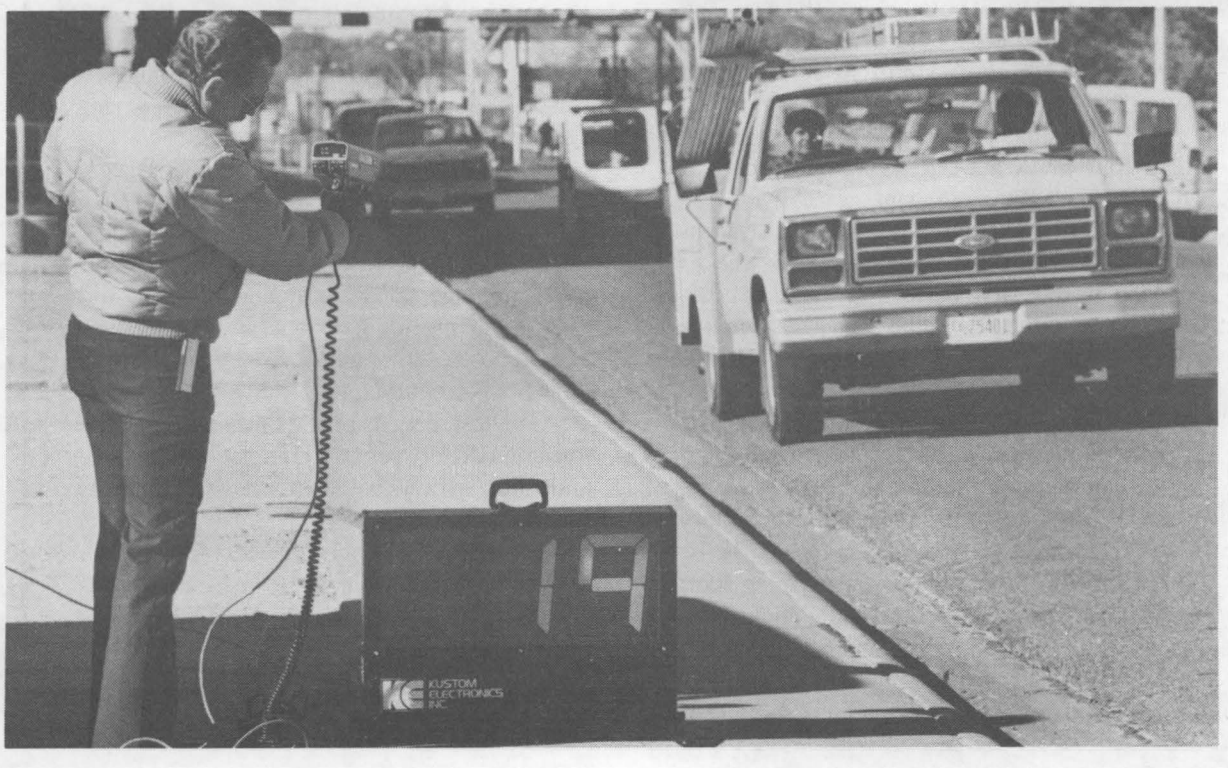
Fred notes that the Materials Sciences awards have generally been for multidisciplinary, multi-organizational research. ''In almost all of the awards, more than one directorate is involved. That's been one of the strengths of Sandia. We can put together interdisciplinary research of high quality.''

It's also a broad spectrum of persons. Fred's list of awardees over the years includes 38 Sandians from Albuquerque and Livermore. ''It's a big list. Although there are some repeaters, it isn't generally the same people.''

Fred sums up: ''We're really quite proud of the awards. They're a sign that our peers value the basic research we're doing. It's a welcome recognition of our status with the scientific world. We feel fortunate that we've done well over the years, and we certainly hope to continue.''



THE HEAT IS ON — or soon will be — for boride samples inside this furnace. Stuart Van Deusen (left) and Terry Aselage (both 1842) are working to produce materials for research that could lead to high-temperature semiconductors; the furnace melts its contents at about 1800°C and lets single crystals form by cooling slowly to about 1000°.



FOUR TOO FAST! Capt. Garland Tilley (3437) checks vehicle speeds inside Tech Area I with Sandia's new radar gun. Garland and four other Div. 3437 employees will use the gun at various times inside all tech areas to enforce the speed limit. Violators — Sandians and contractors — will be ticketed, and supervisors will be notified. "Unless otherwise posted, the limit is 15 mph, and we plan to enforce it strictly," Garland says. "Our intent is not to punish anyone, but to keep traffic at a safe speed and ensure that no one gets hurt."

'High-Tech Garage-Sale Shopper'

Louise Gets the Guns for Tonopah Test Range

Imagine this job announcement in the *Sandia Labs Weekly Bulletin*: ''High-Tech Garage-Sale Shopper. The successful applicant will be responsible for locating and acquiring the following at bargain rates: airplanes, fast-attack vehicles, anti-aircraft guns, radars, camera equipment, and other 'big-ticket' items. Frequent travel required. Ability to negotiate sweet deals a must.''

Certainly, you'll never see that exact ad, but it's pretty descriptive of Louise Bland's job in Property Reapplication Div. 3414. Officially, she's an excess property procurement specialist, and she has, in fact, acquired those specific items and much more at bargain rates in the past few years. Most are surplus items from the military and other government installations.

But Louise (husband Ray is supervisor of Printed Circuit Div. 7413) may have outdone herself earlier this year by acquiring eight Sergeant York automated air defense guns. The Yorks have a book value of more than $31 million, but she acquired them for shipping charges (about $44,000). They will be applied in security and testing programs at Sandia's Tonopah Test Range (TTR) in Nevada (see ''Tonopah Test Range'').

Although Yorks look like double-barreled tanks and use a regular tank chassis, they were built for a different mission — to shoot down low-flying enemy helicopters and fixed-wing aircraft. Yorks were designed to use sophisticated radars (same ones used on F-16 fighters) and computers that could automatically lock-on and track the highest priority target, as selected by the leader of a three-person crew.

The automated Army gun would then signal when it was ready to fire, even emitting a special signal when it ''recommended'' firing. A gunner's touch on the firing button would unleash — on a precisely computed trajectory — about 600 rounds a minute of 40-mm bullets, certainly sufficient to get the attention of any low-flying enemy pilot.

Didn't Work As Planned

It was a whale of a concept. But, for various reasons, it didn't work out as planned. The whole Sergeant York project was killed by Defense Secretary Weinberger in 1985 (see ''Named for Hero''). After the project was cancelled, it soon became history instead of news, and most everyone forgot about it.

That's no longer the case. DoD doesn't plan to resurrect the York as a weapon, but several military and defense-related groups have realized they can make good use of Yorks for other applications — even without firing them. Sandia is among them. About 80 Yorks were produced before DoD cancelled the program, so the eight at TTR make up about 10 percent of the total production.

Carl Smith, supervisor of Optical Measurement Div. 7174 at TTR, says that he and others there went after the Sergeant York guns with a passion after Cecil Lang (7173) came into his office one day this spring with an article out of the *Navy Times*.

''Cecil, who has first-line responsibility for maintaining our heavy-equipment inventory, was really pumped up,'' Carl says. ''The article told how the Navy acquired one of the 60-ton units for shipping charges only and was using it at the Pacific Missile Test Center at Point Mugu, Calif., as a mobile unit for spotting and tracking targets. The article went on to report that the Navy folks liked the first York so well that they ordered two more and a bunch of spare parts.

He's Not Talking Weather

''The York's radars, laser rangefinders, and computers are very sophisticated technical systems,'' Carl continues. ''We figured those features, combined with the York's tough armor plating, would make it an ideal piece of equipment for mobile camera platforms and mobile radar tracking of our targets — rockets, reentry-type vehicles, bombs, and shells — under our harsh environmental conditions.''

The harsh environments Carl refers to have nothing to do with the weather, although it can get a little nasty there at times. He's talking about the blasts, shock waves, and severe overpressures created by TTR's rocket launches, powerful exploding guns, and low-flying bombers and fighter aircraft.

ATOP THE YORK — Excess property procurement specialist Louise Bland (3414) gets a close look at one of the eight Sergeant York automated air defense guns she acquired for Sandia's Tonopah Test Range (TTR). When Louise visited TTR recently to firm up an order for spare parts, TTR's Cecil Lang (7173) gave her this tour. The Yorks, with sophisticated radar systems, will be used at the range for mobile radar tracking of targets and as mobile camera platforms. They may also be used by TTR's security forces.

Carl says the TTR group also thought the range's security force might use the heavily armored vehicles as mobile units for protecting DOE assets. That idea is still being studied.

Carl asked Cecil to go ahead and see what he could do. Cecil, a 28-year veteran at TTR, knew he couldn't waste any time. The *Navy Times* article also noted that other government groups were interested in getting Sergeant Yorks. Cecil called the Navy and quickly set up an exploratory visit to Point Mugu. Making that trip were Carl, TTR Dept. 7170 Manager Ron Bentley, Ted Krein (DMTS, 7174), and a representative of Advanced Security, Inc. (ASI), the private firm contracted to provide TTR security.

''After they returned, we were convinced we could put the Yorks to good use and that they would add a valuable new dimension to our testing capabilities,'' Cecil says. ''I called Louise right away. She had helped us get other heavy surplus items, including some fast-attack vehicles that ASI uses to patrol the range.''

The Battle for the Yorks

Louise went right to work after talking to Cecil. ''My first call was to the Anniston [Ala.] Army Depot, where the Yorks were stored,'' she says. ''A

Tonopah Test Range

'Can-Do' Engineers in Rugged Country

The Tonopah Test Range is a 525-sq.-mi. area ''roughly'' 160 air miles northwest of Las Vegas. If you take that flight, several looks down will let you know that ''roughly'' has several meanings. High, rugged, mostly bare mountain peaks stare up at you much of the way. The long, sharp shadows they cast during the early morning and late afternoon flights reinforce the notion that it's rough and tough country.

Most Sandians who work at TTR take that flight four times a week on a chartered Ross DC-9. The TTR contingent normally works four-day weeks, 10-hour-plus days. That arrangement allows them to live in Las Vegas, makes for longer productive periods at the range, cuts down on the number of flights, and gives employees three-day weekends.

The basic mission of the range is to field-test the weapons designed and produced by DOE's Nuclear Weapon Complex (labs and various production facilities). In many cases, weapons are tested in combination with military delivery systems — rockets, planes, and shells. These are complete field tests, everything short of nuclear explosions; all full-scale nuclear explosion tests are done underground at the Nevada Test Site south of the test range.

TTR also allows and conducts some tests for the military on a time-and-space-available basis. (Upcoming LAB NEWS issues will include more about TTR's work and capabilities.)

The range itself is mostly flat, a long valley of dry lake beds and scrub-brush desert that lies between two mountain ranges — the Cactus Range on the west and the Kawich Range on the east. TTR's main building complex is located on one of the valley's few hills, giving a good view of the surrounding area.

The 51 Sandians in TTR Dept. 7170 seem to fit the country. They're rugged folks with can-do attitudes — mostly engineers and technicians — the kind who'd rather work their tails off 10 or more hours a day and get some dirt under their fingernails than sit in meetings and write reports, although they do their share of those necessary tasks, too.

The test range is one of those places where you immediately sense a high activity level — something's always going on. If tests aren't being done on a particular day, you can bet they're either being planned or evaluated.

TTR Dept. Manager Ron Bentley says, ''I've been out here 13 years, and I haven't had a boring day yet. I admit, though, sometimes things get so hectic that I'm tempted to pray for a boring day.''

(Continued from Preceding Page)

man who wasn't familiar with Sandia answered. I hurriedly explained who Sandia is, what we do, that we wanted to get some Sergeant Yorks, and how we planned to use them. There was a long silence. Then he said, 'Now run through that again, and this time *very slowly*,' '' she says, with a hearty laugh.

After Louise re-explained it to his satisfaction and convinced him Sandia was a ''good guy'' with a legitimate need, he put her in touch with Bill Arnold, head of the Army's Sergeant York dispersal project office at Rock Island, Ill.

Louise quickly realized she was on the right track after she contacted Bill. ''He is one of the nicest and most helpful people I've ever dealt with,'' she says. ''Bill knew about Sandia and something of our reputation. And he was extremely helpful in expediting the York transfer to us once he was convinced of our need. The world could use a few more people like Bill Arnold.''

There's more to the story, and Louise had considerable work remaining to complete the deal, but it was pretty smooth sailing after Bill approved Sandia's request. Gene Arndt (7171) and Jerry McCorkle (7174) spent two days last May at the Anniston Army Depot carefully checking the 38 remaining Sergeant Yorks in the inventory. Gene checked out the radars and electronics, and Jerry the mechanical and optical systems.

Representatives of several other government and military groups that wanted Yorks were there doing the same thing. At the end of the second day, Gene and Jerry and the other representatives participated in a ''draft'' system for the available Yorks.

Home on the Range

The Yorks that Gene and Jerry selected arrived at the range in October. Appropriate TTR employees are familiarizing themselves with the units, getting trained to drive them and operate the technically sophisticated instruments, planning maintenance programs, and firming up exactly how they can be used to the best advantage.

''There's only one small hitch right now,'' says Carl. ''The Army hasn't transferred ownership of the Yorks to Sandia, but technically is loaning them to us for an unspecified time. That means the Army reserves the right to recall them, so we can't modify them *irreversibly*. If they're ever declared surplus property, we'll probably wind up owning them.

''In the meantime,'' Carl continues, ''we can use them for our legitimate needs, even making minor modifications — as long as we can easily restore them to their original condition.''

Louise is now in the process of acquiring three more Yorks — primarily for their radars — for Dave Bickel's Track and Cables Div. 7535 and several million dollars worth of spare parts — again for shipping charges only.

Louise is one of several people in Roscoe Williams' Property Reapplication Div. 3414 who help Sandians recycle and reuse equipment efficiently. It's a two-way street: The division helps locate and acquire items that Sandia needs; it also makes Sandia's excess equipment available to other government groups.

The efforts of Louise and others in division 3414 are appreciated around the Labs, especially so at TTR. ''Their knowledge and willingness to help really pay off for us all,'' Carl says. ''If it weren't for those folks, we probably wouldn't have half the heavy assets we do at the range.'' ●LP

RADAR SYSTEM on one of the York guns is checked at the Tonopah Test Range by (from left) Carl Smith (7174 supervisor), Jerry McCorkle (7174), and TTR manager Ron Bentley (7170). The sophisticated radar system is the same type used on the advanced F-16 fighter aircraft — the Fighting Falcon. The round unit that Ron is checking is a targeting radar; the rectangular unit is a surveillance radar. One of the uses planned for TTR's Yorks is mobile radar tracking of targets.

Sergeant York Gun Named for Hero

Sergeant Alvin York — a reluctant warrior, but one of America's all-time finest. Denied status as a conscientious objector, the shy blacksmith was drafted out of Cumberland Hill, Tenn., during World War I and went on to become one of the war's genuine heroes.

His wartime achievements are legendary. His most celebrated achievement happened while he was behind enemy lines on a patrol to take out a German machine-gun emplacement that had stopped his regiment from advancing. The 17-man patrol became pinned down by enemy fire, and about half the men became casualties. With the rest of them taking up a defensive position, Sergeant York (a corporal at the time) went on a one-man offensive.

Firing rapidly and with deadly accuracy, he reportedly killed 20-some enemy soldiers, causing the remainder to surrender. On the way back to the American lines, he captured even more, for a total of 132 prisoners by the time the patrol returned.

York was promoted to sergeant, and later received the Congressional Medal of Honor and other high honors, including some from other countries. After the war, he returned to his native Tennessee and farmed land given to him by that state. He also helped establish an industrial institute and a religious school for rural youth. He died in Nashville in 1964 at the age of 76.

Several years ago, the Army decided to name a new high-tech, mobile anti-aircraft weapon in his memory — the Sergeant York automated air defense gun.

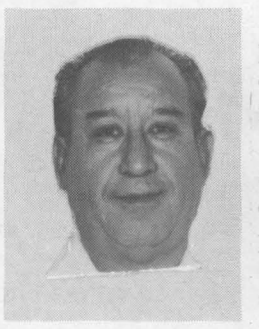
Unfortunately, the gun didn't live up to its billing, even after repeated attempts to correct problems. Secretary of Defense Caspar Weinberger decided in 1985 to cut the government's losses and cancel the problem weapon after about 80 guns had been produced. (The Feb. 1987 *IEEE Spectrum* includes an interesting article about the gun — its design features, its problems, and why it was cancelled, pages 28-35.)

Tennessee folks are justifiably proud of their native son, and many objected that the war hero's name continued to be used to identify the problem-plagued weapon that would never see action. US Senator Jim Sasser of Tennessee even asked the government to revert to using the gun's former generic name, Divad, short for division air defense.

But the new name generally stuck. Most still refer to it as the Sergeant York gun. Sandia and some other government-related groups will use some of the guns in other productive ways (see main story).

B-1 BOMBER just after it releases a bomb (with inert warhead) during a weapon test at Sandia's Tonopah Test Range in Nevada.

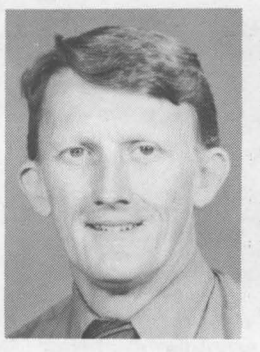
Deaths



Manuel Baca of Transportation Services Sec. 3423-1 died Nov. 16 after a lengthy illness. He was 60 years old.

He had been at the Labs since January 1976, most recently as a transportation dispatcher.

Survivors include his wife, two daughters, and one son.



Michael O'Bryant of Project Design Definition Div. VIII 2858 died suddenly Nov. 30. He was 48 years old.

Mike had been at the Labs since October 1960. He was a senior technical aide.

Survivors include his son and daughter.

Alliance Helps Upgrade Education for Minorities

When George Arnot retired two years ago after working 37 years, primarily in Radar Dept. 2340, he hadn't planned a second career.

But today he's a full-time faculty member at New Mexico Highlands University. Besides teaching courses in electronics, he's helping to develop the curriculum for the university's new degree program in Engineering Technology.

George's work at Highlands is just one of the results of Sandia's involvement in DOE's multi-lab Science and Technology Alliance.

Alliance Formed Last Year

The Alliance was formed last year when Sandia, along with Los Alamos and Oak Ridge national labs, signed a memorandum of understanding with three educational institutions — the Ana G. Mendez Educational Foundation, San Juan, P.R.; North Carolina A&T (Agricultural & Technical) State University, Greensboro; and New Mexico Highlands (LAB NEWS, Dec. 1, 1987). Though there are similar agreements between individual labs and minority institutions, this is the first involving several labs.

"The goal of the alliance," says Dan Hartley (6000), who represented Sandia in the signing of the agreement, "is to help minorities achieve a high-quality education in science and engineering and to increase the representation of Blacks, American Indians, and Hispanics in the scientific and engineering programs of DOE, other government agencies, and private industry."

To achieve the goal, the participating labs give special assistance to the three educational institutions, each of which has a minority enrollment of more than 50 percent.

That assistance takes a variety of forms, depending on the particular needs of the institutions — and the talents and resources of the labs.

New Degree Program

Sandia's current collaboration with Highlands University focuses on helping the university develop and obtain accreditation for a new Engineering Technology degree program.

Last year, when the university requested Sandia's help in identifying qualified technical staff who might be interested in teaching courses in the new program, Sandia identified George.

"I agreed to go to Highlands to teach a couple of classes during the spring semester," recalls George.

SPECIAL THANKS for the donation of equipment to New Mexico Highlands University went to Hewlett-Packard recently at an informal meeting of the Science and Technology Alliance. The company was also invited to become an industry affiliate of the Alliance. Attending the meeting were Ed Bernal (left) of Hewlett-Packard; Dan Hartley, VP of Energy Programs 6000; Gilbert Sanchez, President of Highlands; and Abad Sandoval, LANL Community Relations Officer. Other Hewlett-Packard representatives attending the meeting were Walt Rozum and Loren Vaughan.

"But after I got there, I got involved in designing other classes and in 'working out the bugs' to get continuity in the courses for the new program — and stayed."

Laboratory equipment to support those courses is being provided jointly by Sandia and Hewlett-Packard. Sandia (Div. 3510) is providing, on long-term loan, an HP1000 real-time computer system; Hewlett-Packard has donated an HP 3852 data acquisition subsystem.

John O'Hare (7532) worked with Professor Calvin Thomas to evaluate existing equipment at Highlands and advised Hewlett-Packard on the additional equipment needed to complete the system. "There'll be 12 to 13 terminals in the laboratory, so 20 or more students can be working at the same time," says John. "It's a sophisticated, up-to-date system. They'll be able to teach high-level data acquisition techniques, interfacing, data management, all sorts of data analysis, and programming — even subsystem programming."

"This equipment considerably enhances the program's prospects for accreditation," says Nestor Ortiz (6410). "Once installation is complete, it will provide Highlands with a state-of-the-art system."

Research Programs

Other activities of the alliance include summer student programs and research programs that mutually benefit participating labs and universities.

Proposed research projects with North Carolina A&T State University and New Mexico Highlands grew out of the annual symposium on research for DOE Basic Energy Sciences held at Sandia this summer, according to alliance coordinator Ken Holley (3510).

"Representatives from both universities attended the symposium and met with several members of Sandia staff and management," says Ken. "As a result, research areas of mutual interest to Sandia and to each school were identified — both schools have already submitted solid proposals to the alliance, and we're working right now on obtaining funding for the projects."

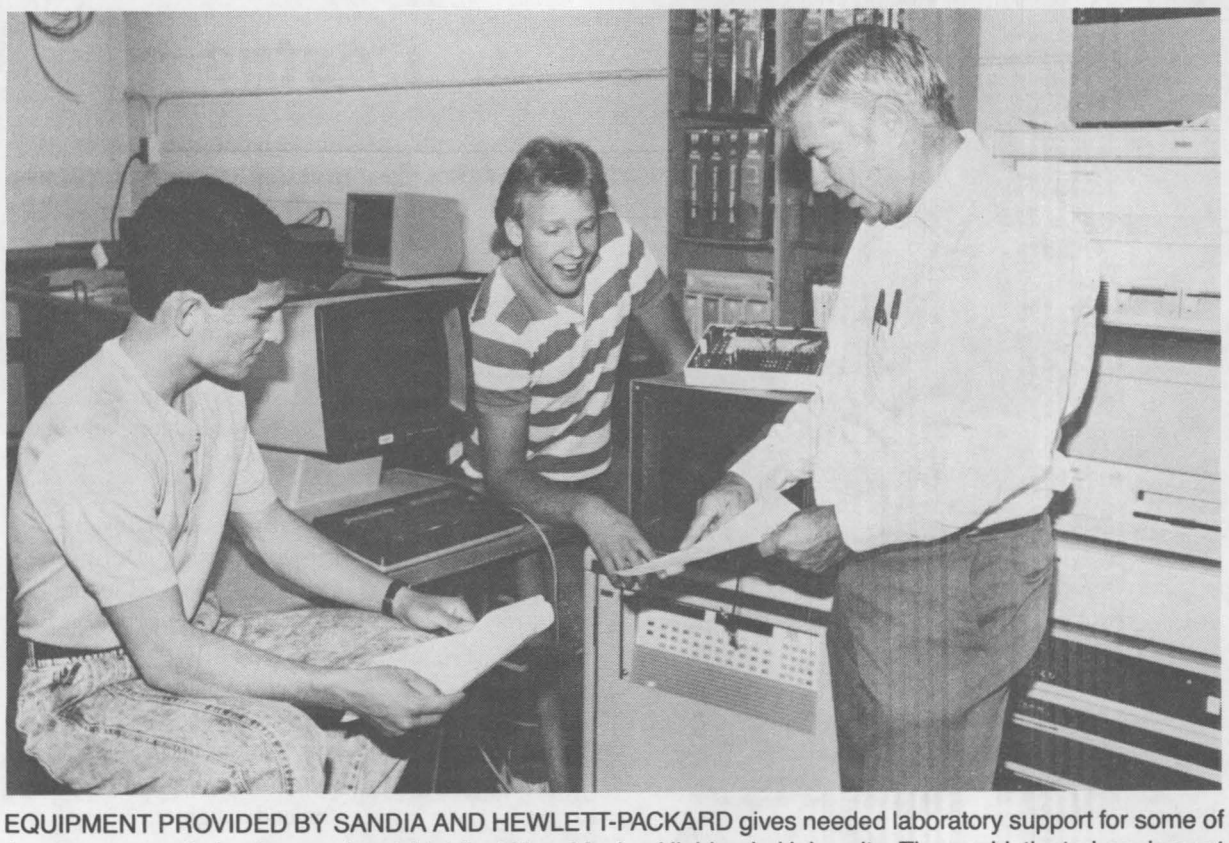
The Alliance's summer student program is also off to a good start, according to Ken. "Our first summer student — Jose Vigil from Highlands — has just completed a summer assignment at Sandia, and we'll be placing as many as 18 students among the three participating labs next summer."

Jose worked under the supervision of Maurice Dillon in Laser Projects Div. 1275, helping in the set-up and operation of high-power excimer laser systems and the repair of the 1.7-megavolt electron-beam accelerator for the DELPHI program.

"I can't praise Jose enough," says Maurice. "He's a remarkable young man — very bright, learns quickly, and is able to anticipate problems and procedures. I've recommended him strongly for future employment considerations at Sandia."

"This is where everyone stands to gain," says Ralph Bonner, Director of Personnel 3500. "When the Alliance helps participating universities develop the programs and capabilities needed to turn out well-educated and trained people, we all — the minority students themselves, Sandia, the other labs, DOE, and private industry — are getting the benefits."

●DR



EQUIPMENT PROVIDED BY SANDIA AND HEWLETT-PACKARD gives needed laboratory support for some of the classes taught by George Arnot (right) at New Mexico Highlands University. The sophisticated equipment also enhances the prospects of gaining accreditation for the university's new Engineering Technology degree program. George began his teaching career after retiring from Sandia.

Sandia Positioned to Respond to National Security Needs

Referring to Small Staff's Nov. 21 and 22 briefing of all Sandia Albuquerque supervisors, managers, and directors — and recalling the first such briefing last year — President Irwin Welber called it "this troupe's second performance."

Again this year, the overall aim of the briefing was to share with the audience in the Tech Transfer Center — and, through that audience, the rest of the Labs — top management's view of how Sandia is positioned to respond to national security needs. (A Sandia Livermore briefing is set for Jan. 17.)

Providing a preview of the vice-presidents' remarks to follow, Irwin noted that "the efforts of Sandia depend to some extent on its environment." Key elements of this environment include:

1. The need for weapons tailored to new threats (countermeasures, mobile missiles, etc.);
2. The need for modernization of the nuclear stockpile, in particular its safety and quality;
3. The increasing attention due Environmental Safety and Health (ES&H) problems;
4. The need to upgrade the nuclear production complex;
5. The increasing demand for treaty verification expertise;
6. Energy issues; and
7. The need to revitalize US industry (specifically, the importance of tech transfer).

"But the biggest challenge is the nation's budget deficit. It's now having — and will continue to have — a major impact on both Sandia and the US," said Irwin.

Irwin also pointed out that the size of the Labs now is "about right" (a comment later reinforced by EVP Lee Bray, 30): "It lets us cover a whole gamut of activities — research, design, development, testing, and the tech base needed to support those activities. But to maintain 8000-plus people on-roll in times of tight [Defense Program] budgets means we have to look at reimbursables and other programs. At the same time, we've got to be very careful that we don't depart drastically from our major mission" (nuclear weapon work).

Flexibility Necessary

"I think we're organized properly to respond to change," he concluded. "What we have to work on is the ability to recognize change and the flexibility to deal with it productively."

Controller Paul Stanford (100) told the group that the mid-80s were a growth period for Sandia budgets, and that "these allowed us to upgrade our facilities and hire some bright new people.

"For FY89, there should be no budget cuts, and DOE is tentatively projecting a modest increase in its funding — perhaps three percent — for FY90, which is less than expected inflation," he continued. "But we'll have to respond, along with the rest of DOE, to pressures to reduce the federal deficit and remedy problems in the ES&H and nuclear-material-handling arenas. These pressures will definitely affect Sandia."

EVP Orval Jones (20) pointed out that communication, such as that exemplified by the management briefing, "is crucial. We can't expect you [the assembled supervisors] or our employees to fly blind, to exercise initiative and responsibility without information."

Orval went on to discuss three of his current concerns:

1. *"A shift in emphasis in our conduct of main-mission business, that is, in our weapon work."* He sees a tension between Sandia's traditional goal of introducing technical innovation and current demands for achieving a high level of manufacturability, quality, and cost-effectiveness.
2. *Integrity and respect*. "We've all read stories of contractor fraud, abuses, and mismanagement," said Orval. "These affect all of us, even if we're not involved.

"I'm proud that AT&T hasn't been involved in such scandals, and I'm even more proud Sandia hasn't. But we can't take any of that for granted. Our reputation, our integrity is, in the long run, our treasure. We've got to work, on a daily basis, to pay attention, to ensure it won't happen here.

3. *Opportunities for the future*. "I was recently asked whether, as weapon funding decreases, Sandia would face layoffs," said Orval. "For two reasons, I don't think that's likely today. First, we're now a multi-program lab. As our funding from some sources goes down, that from others goes up.

"Second, I believe that today we're perceived by the government as a special resource, characterized by exceptional talents with regard to weapon safety and reliability, and by exceptional technical objectivity — our unique no-profit, no-fee contract means that we can render the hard-nosed technical judgments the government sometimes needs. We can provide special protection for ideas, designs, and hardware; that is, we can keep our collective mouth shut. We can handle high levels of technical risk. And we can provide proof-of-concept demonstrations — and rapidly, thanks to overall Labs capabilities that allow quick response in a wide range of modern technologies."

Vital to the Nation

"So, if we measure up to our responsibilities, we're vital to the nation in a broad range of activities," Orval concluded. "We've proved that we can perform, in Harry Truman's words, 'exceptional service in the national interest.' That's our job. Keep it in mind."

EVP Lee Bray (30) spoke on the theme of change and how it has affected — and will affect — Sandia. "We've undergone some dramatic changes already," he noted. "Just 15 years ago, we were a single-purpose lab. Today, 40 percent of our funding comes from programs and customers we didn't have then.

"The question is, 'What can we learn from that change about where we are today and where we're going?' I think that (except for the 'energy crisis') our push toward new funding sources — 'reimbursables,' to use the common term — was internally driven. But we're now facing some external drivers" (for example, the INF treaty, proposed arms limitation and test limitation treaties, the federal deficit, the balance of trade, and ES&H problems).

"How will Sandia emerge? I think we're positioned well, and our past indicates we can change as the needs of the nation change."

Lee then discussed four "points for the future":

1. We need to maintain our size and strength — and breadth. "Our testing capabilities, our tech base, our development shops — the whole array of activities and services we can bring to bear to provide solutions. These are our foundation, so they're critical.

   "So is the mentality that says our size is *our* responsibility," not that of any funding source. Accepting that responsibility "will keep us proactive, energetic, and driving hard — and only by driving hard can we maintain the array of support that provides opportunities and options to federal decision-makers."
2. "We'll have to earn our right to serve. At our founding [in the late 40s], we were commissioned, established, appointed. Now we have to compete — not, of course, with industry, but to show we have unique services to offer — and to grow our capability to compete";
3. We have to become even more sensitive to customer needs; and
4. We have to continue to emphasize quality.

"These last two interrelated points will have to be the cornerstone for anyone's business in the future, and Sandia is no exception. Without understanding the customer and being sensitive to customers' needs, we can't earn the right to serve. (Note that I'm using 'customer' to mean 'next user'; every one of us has customers even if we don't deal with the 'outside world.')"

Lee believes Sandia is capable of meeting such challenges. And he doesn't foresee a time when there won't be a need for resources such as Sandia — "not until there're no national problems for which we're suited to help in finding solutions."

General Attorney Bob Kestenbaum (4000) told the group that the recently signed AT&T-DOE contract "may be the best contract ever." It contains strengthened wording that continues to prohibit certain expenses: corporate contributions, lobbying activities, first-class airfare, and purchase of alcoholic beverages.

Bob Peurifoy (7000) added that the latest contract renewal was simply the most recent indication of AT&T's continuing willingness to perform a valuable public service, and that "we should be grateful to our parent organization for the stewardship and for the contract."

Ruthlessly Pursue Demolition

(Adding some perspective to current funding discussions, Bob noted that he came to Sandia in 1952 — "at a time when the weapon program was in decline.")

Bob then summarized the Labs' construction program (LAB NEWS, Nov. 4, 1988). He noted that three quarters of an acre of temporary and substandard facilities have recently been removed, and he reiterated his pledge to "ruthlessly pursue demolition" of other buildings. "We now have some 700,000 square feet of antiquated space," he said. "I want to get that down to 400,000 — and, eventually, zero."

Dennis Roth (3000) discussed the increasing cost of doing business these days, including such areas as ES&H ("lots more documentation, lots more oversight coming," he warned), the need for new computer systems and expanded security programs, the expenses associated with upkeep of new buildings, increasing utility bills, and rising medical insurance costs and gross receipts taxes ("Our tax bill will be nearly $40 million this year," he noted).

He also emphasized the increasing focus on "human-reliability" problems. "That term translates to drug-use problems in our society," he commented. "Sandia lives in that society, so we face problems too." (Sandia has, of course, had a rehabilitation program for alcoholics and other drug users since 1972.)

Venky Narayanamurti (1000) discussed the role of research at Sandia: "We in 1000 have two goals. One is to support the missions of the Labs — which means that most of the other vice-presidencies are our customers." The second is "to do desirable work on emerging technologies that are consistent with — and would enhance — future missions of the Labs."

Venky also noted the increasing importance of communications within the research groups, with their management, and with their in-house customers: "As Kumar Patel, my previous boss at Bell Labs, used to say, 'Research needs to be insulated but not isolated.' That's what I see as my charter."

Decreasing Dollars, Increasing Workload

"We've been accused of cutting the budget for exploratory development," said Everet Beckner (5000). "But that's necessary to meet our obligations on specific weapon programs. The solution is to work more efficiently, build higher quality into

(Continued on Page Twelve)

(Continued from Page Eleven)

Mgmt. Briefing

our products, and pool projects — that is, talk to your neighbors!''

''Sandia Livermore is also, of course, governed by the paradox of decreasing Defense Program dollars and an increasing workload,'' said John Crawford (8000). He discussed current weapon programs at SNLL and mentioned the possibility of three more programs in the future. He also showed how the Combustion Research Facility's interaction with industry and academia — ''that means automatic tech transfer'' — is a useful model for other Sandia programs.

The quality theme mentioned by Everet was discussed at some length by Glen Cheney (2000). He defined quality as ''consistently meeting and exceeding customers' needs, wants, and expectations through a process of continuous improvement. Quality means more than satisfying customers; it means delighting them.''

He then showed how that definition applies at Sandia — ''we may be insulated from the commercial marketplace, but quality has always been a goal of Sandia. And we're now seeing new ways of measuring the quality of our products, especially when it comes to manufacturability. Customer expectations are rising; they're no longer asking 'How well are you doing?' They're now asking 'How have you improved?' and 'How did you measure that improvement?' in the quality of our products, services, and processes.''

On the Front Shelf

Roger Hagengruber (9000) presented current data on the impact of Sandia's reimbursable programs on the Sandia budget and work force. ''Today we have about 4050 technical FTEs. Of those, about 1030 are working on reimbursable projects; that represents 27 percent of Sandia's FTEs and nearly 30 percent of Sandia's budget — which makes our program very visible, putting us up on the front shelf when Congress, GAO, OMB, and others want to determine whether we're doing our job right and working on appropriate jobs.

''Our reimbursable programs bring us sponsors who come here for product. They look for cost-effectiveness and responsiveness.'' Roger predicts some growth in several programs — survivability and command-control, directed-energy weapons, verification and arms control, and SDI (both research and engineering).

''We have a very exciting future — plenty of engineering jobs that can generate support, passion, and enthusiasm from you and your staffs.''

Finally, Dan Hartley (6000) embraced the notion of change: ''Sandia accepts change — we excel at finishing one thing and getting on with another. Sandia can help in, for example, providing an understanding of such global problems as the 'greenhouse effect.' ''

The briefing ended with a general question-and-answer session. Videotapes of the three-hour Nov. 22 presentation will soon be available to any Sandian in the Tech Library (Rm. 9). Supervisors and managers are encouraged to use the tapes as a springboard for discussions with their subordinates. •BH

AS THE SAFE GOES, so goes Finance — As seekers of travelers' checks, cash, and tickets have learned this past week, the safe, along with Assistant Treasurer and Financial Dept. 4020, was moved out of the south wing of Bldg. 802 last weekend. The safe and the tellers are now in T-17; some other members of the department are in T-14. That is, they're in temporary offices north of Bldg. 802 and east of Bldg. 815. Here, Clarence Filip (4021) and Alice Miner (4020) pause as the safe, which weighs a couple of tons, heads for its new home. Escorts for the nearly three-hour journey were Dave Braggs (left rear) and Cecil Blancett (both 3434).

THEY KNOW WHAT they like, and they know art, too — theirs is on display in the lobby of Bldg. 802 and in the Technical Library. It makes up an exhibit of Sandia's technical art from the last decade or so. The artists are (from left) Lee Cunningham, Bonita Skenandore, Ray Lamb, Ted Baggett, Clyde (Buzz) Babcock, Jerry Gorman, Tom Dragoo, George Dooley, and John Bell. All except Ted are in Presentations and General Art Section 3155-1; Ted, who's in Graphic Design Section 3155-4, designed the exhibit. According to 3155-1 supervisor Cynthia Figueroa-McInteer, it's the first time the Tech Art group has staged a joint display (though individuals' personal creations have appeared now and then). The display will remain until after the Christmas break.

NOT TOO LATE if you want to help the Systems Evaluation Directorate 7200 provide shoes for needy kids. Although some 40 students of Eugene Field Elementary School got their shoes through 7200's Shoes for Kids program (aided by a sizable discount from Kinney Shoes in Coronado Center) last week, two more group fittings are coming up — Mission Elementary on Dec. 12 and Emerson on Dec. 13. More info on how and why to donate to the cause from Linda Vigil-Lopez (7212), here plying her shoe-fitting skills. And "Thanks!" from the Eugene Field kids to those who have contributed already.

Take Note

More than 150 energy experts from throughout the US are expected to attend a national conference on ''Technical Change and the Politics of Energy'' at the LANL Center for National Security on Dec. 12-13. The invitation-only conference will focus on future economic, political, and scientific developments that will have an impact on energy production and use. Other topics: prospects of nuclear power, fusion energy, natural gas, geothermal energy, and coal. Dan Hartley (6000) is co-chairman of a panel, Electric Power II - Other Electric Power Technologies, and a member of the Outlook Assessment panel.

Christmas Projects

Org. 2800 is holding its 31st annual Christmas food basket drive now through Dec. 16. Tim Dubay (2857) and Gene Arnot (2851) are co-chairmen this year. Cash contributions are being solicited for gift certificates to be given to families selected from area schools. To contribute, call Tim on 6-6123 or Gene on 4-7521. Boxes are also set up in Bldgs. 836 and 892 for contributions of new or good used toys.

Retirees John Shunny and Julian Sanchez will deliver Christmas checks on Dec. 18 to needy families along South Highway 14. Money for the project is collected all through the year from the sale of Sandia caps and T-shirts. ''Because of inflation we have to increase the amount of our gifts to $250 each,'' says John. ''That means fewer families will receive donations this year.'' Sandia caps and T-shirts — plus a new cross-country ski trails book by Sam Beard (1553) — are available in the LAB NEWS office in Bldg. 814.

"SKINNY-SKI" EXPERT Sam Beard (1553), shown here on a recent snowless day in the Sandias, has updated and published a second edition of his 1978 book, "Ski Touring in Northern New Mexico." The new version, edited by John Shunny (ret.), gives a detailed rundown on the best cross-country skiing opportunities in the northern part of the state. A limited number of copies ($9/ea.) are on sale in the LAB NEWS office (Bldg. 814); part of the proceeds will go to the South Highway 14 Christmas project.

Pete Richards (1112), Sandia's ambassador to Tibet, couldn't return to his favorite land this year because of the political situation. Instead, he opted to ride his mountain bike in Ladakh, a remote province in the Himalayas of northern India. Ladakh, open to foreigners only since 1974, has been described as ''more Tibetan than Tibet.'' Pete will show slides of his trip, which also included Kashmir, on Dec. 13 at noon in the Technology Transfer Center (Bldg. 825). For more information, contact Pete on 4-2616.

* * *

Career Services for the Handicapped (a United Way agency) has been named a finalist in the J. M. Foundation's Search for Excellence, a national competition to identify the country's best vocational programs for people with disabilities. Founded in Albuquerque in 1977 to provide vocational options to people with handicaps, Career Services creates jobs through its Community-Based Work Service program by contracting to provide clerical and other services to the private sector. Sandia is the largest customer of the award-winning program, which served 382 people with disabilities in Albuquerque last year.

Sandia organizations needing short-notice, short- or long-term clerical support can call Mike Robertson (3533) on 4-8976. He'll work with Mary Modrow, director of contract services at Career Services, to find people to do the job — and will give advice on case charges. ''We've also been able to match people for jobs other than clerical,'' says Mike. ''We had some workers, for example, doing the masking on parts before they were painted.''

Sandia Colloquia

Peter Bartels (University of Arizona) will speak on ''Pattern Recognition and Image Processing'' on Dec. 16 at 9 a.m. in the Technology Transfer Center. He will be hosted by Larry Dalton (2336). For more information, call Larry on 6-0140.

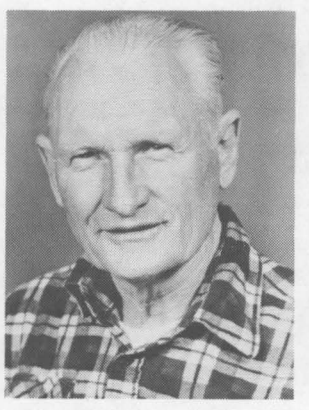
Retiring and not shown in LAB NEWS photos: Fred Hansen (9142), Esther Coffman (1820), Mary Clay (5122), John Gunby (7812), Alice Moore (3141), James Reid (5261), Betty Tanner (9110), Alfonzo Trujillo (5141), and Ruth Whan (1820).

Retiring

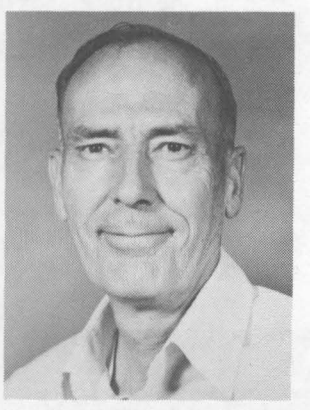
Al Martin (7852) 37

Bob Sharp (7864) 32

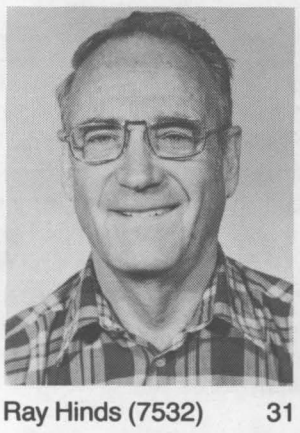
Dick Burken (3735) 34



Bill Foy (7556) 37



Erwin Stewart (7812) 33

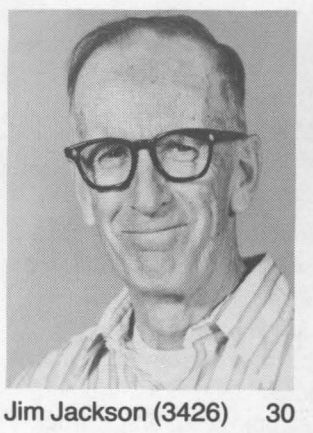


Ray Hinds (7532) 31

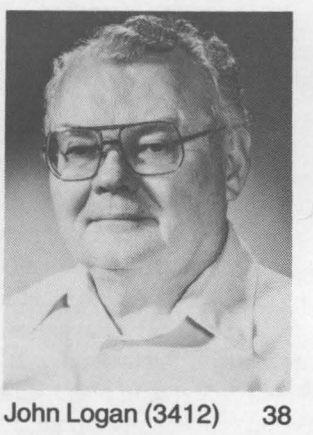
Joe Angel (3434) 36

Dale Fimple (5268) 27

Loyd Keller (5154) 34



Jim Jackson (3426) 30

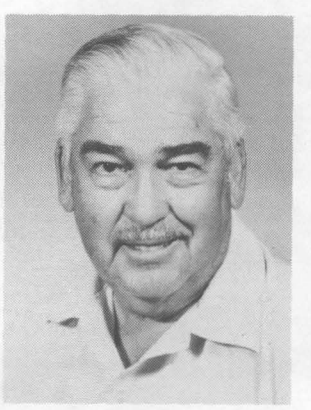


John Logan (3412) 38

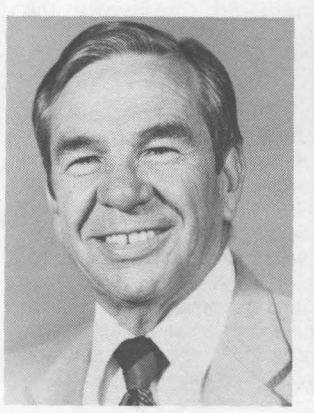
Ed Brass (2000) 31

Lorenzo Garcia (7413) 37

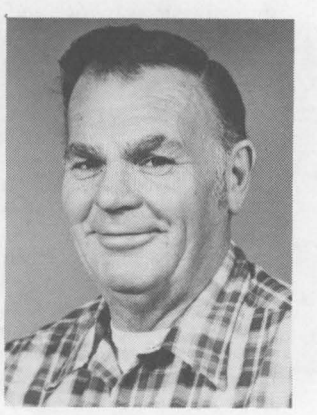
Procopio Lopez (7481) 37



Bennie Gonzales (7812) 31



Chris Padilla (2831) 40



John Snyder (7234) 32

Supervisory Appointments

NANCY PRUETT to supervisor of Archives and Records Management Section 3141-2, effective Oct. 16.

Nancy joined Sandia's Technical Library Reference Division in April 1981 as a technical information specialist. In July 1986, she joined the Technical Library Systems Design Division, where she was a library systems analyst until her promotion.

Before coming to Sandia, Nancy was head of the UCLA Geology/Geophysics Library. She's a member of the Special Libraries Association, the American Libraries Association, the Western Association of Map Libraries, and the Geoscience Information Society.

She has a BA in geology from Rice University (Houston), an ML in library science from Texas Woman's University (Denton), and an MBA from Southern Methodist University (Dallas).

In her spare time, Nancy enjoys cross-country skiing, hiking, mountain biking, and reading science fiction. She lives in the NE Heights.

JUDITH HUBBARD to supervisor of Mail Services Section 3154-4, effective Sept. 1.

Judy joined the Labs in April 1985 as a security inspector in Patrol Div. North - 3434. She was promoted to Lieutenant in June 1986.

She has a bachelor's degree in university studies from UNM and will begin work toward a master's degree in management at UNM next summer.

In her spare time, Judy enjoys reading, gardening, classic movies, and traveling. She lives in the NE Heights.

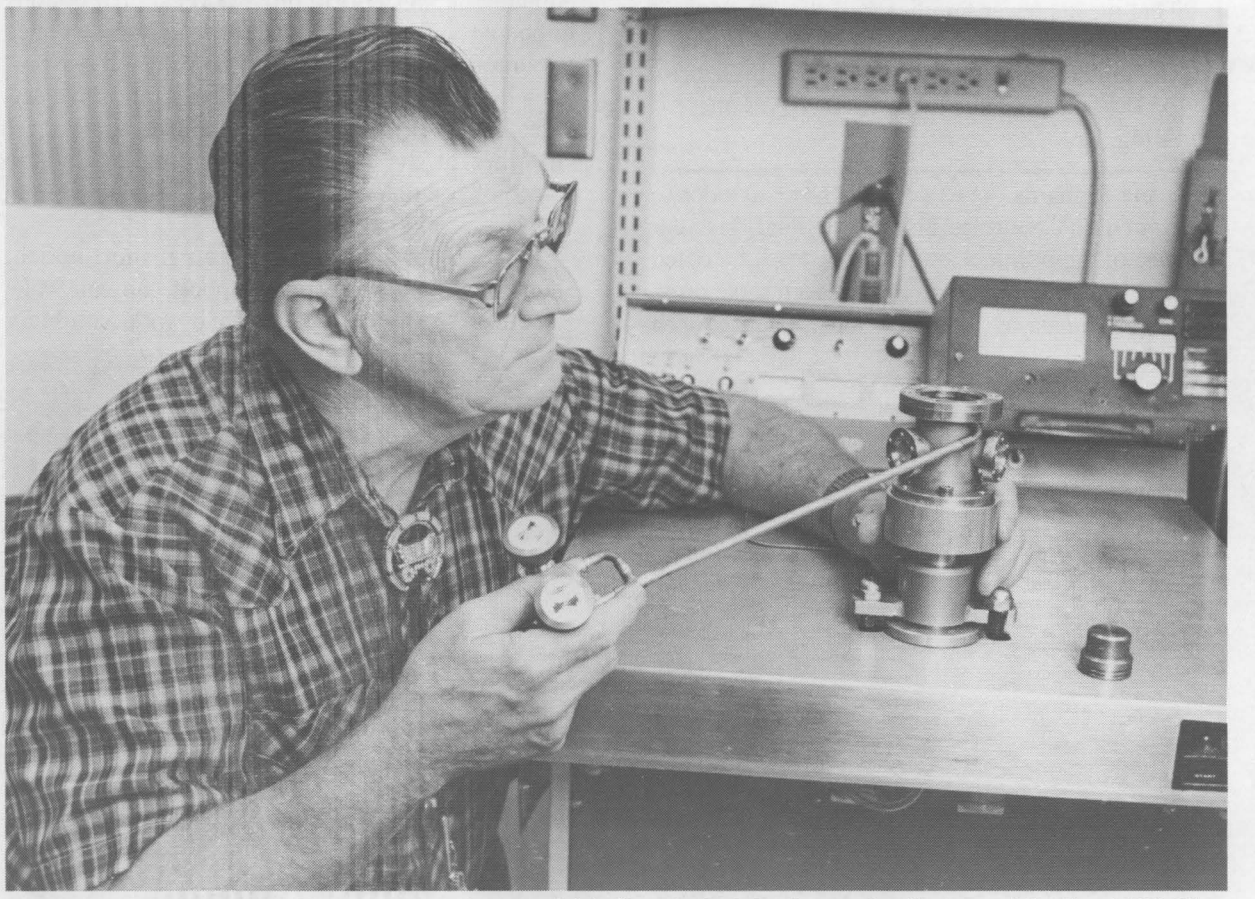
Hot Line on Exec-Etiquette

Today's fast-track executive is troubled by more than just business plans, competition, and the next raise. The up-and-comer is also asking: How many times can I let the office phone ring before answering it? What should I give the boss for Christmas? Is there anything wrong with letting a waiter pepper my steak before tasting it?

"At-Ease Hotline" [of Cincinnati] supplies the answers to those and hundreds of other queries for socially klutzy executives. . . And what are the answers to the three questions above? Three. Nothing. And not at an interview meal. It suggests hasty judgment.

Jolie Solomon, *Wall Street Journal*

IT'S OKAY TO SPREAD CHRISTMAS CHEER, but please don't toss your cookies in the out basket. "Inappropriate items that have shown up in the mailroom include a whole fruitcake stuffed inside a messenger envelope, party invitations, blank checks, spools of wire, and even a set of towels," says Judy Hubbard, supervisor of Mail Services Section 3154-4. As you can see above, the mail clerks (from left: Jan Wallner, Nick Martinez, and Paul Gallegos) have their hands full with regular company correspondence. Give them a Christmas present this year by delivering your Christmas greetings and gifts in person; and be sure to include organization numbers on all correspondence. Mail containing material or personal correspondence will not be delivered — and not just during the holidays but all year around. Items that cannot be sent through company mail include clothing, gift catalogs, personal magazines, and incoming personal correspondence. "But it's okay to send out personal correspondence as long as the proper postage is affixed," adds Judy.



GERRY FOWLER (1134) demonstrates the coaxial helium leak-detection probe that won him the 1988 Shop Note Award from the *Journal of Vacuum Science and Technology*. The probe supplies helium through a small center tube and exhausts the excess through an outer tube. This arrangement keeps the helium precisely where needed and allows pinpointing of leaks to within 1/16 inch. Like standard non-exhausting helium probes, Gerry's is used with a mass spectrometer, which detects the helium when it is drawn through a leak. But standard probes let helium drift over the whole test object and so make it harder to localize the leaks. Gerry's probe is the kind of novel solution to instrument problems that is recognized by the annual Shop Note Award, sponsored by the American Vacuum Society's Vacuum Technology Division. The award (a certificate and cash prize) was presented to Gerry at the Awards Assembly and Reception held in Atlanta, Ga., on Oct. 4 in conjunction with the Society's 35th National Symposium. Gerry has worked with ultrahigh-vacuum technology for 32 years.

Welcome

Albuquerque
- Patricia Arrendondo (144)
- Kristina Buchholtz (9226)
- John Joseph (2532)
- Leonard Malczynski (3411)
- Eric Tomlin (7254)

Arizona
- Ralph Barker (1112)
- Philip Gackle (2335)

California
- Steven Rohde (9127)

Maryland
- David Thomson (7124)

Michigan
- Russell Miller (9211)

New Mexico
- Susan Pickering (6330)
- Cornelia Torres (154)

New York
- Grant Heffelfinger (6257)

Texas
- Michael Baird (7865)
- Ron Eimer (3311)
- Ruby Hsia (3142)

Fun & Games

Bowling — Winners of the SANDOE Bowling Assn. Best Ball tournament at Iceland Bowl on Nov. 12-13 were Laura Grover and Oliver Sharp (guests) with a 762 handicap series. Second went to Roni and Mike Montoya (guests) with a 744 handicap series.

October Bowlers-of-the-Month included: Scratch — Bob Barton (3745), 722, and Karen Varga, 572; Handicap — Daniel Baca, Jr., (7813), 581 and 692, and Pat Mefford (6442), 515 and 671.

The Bowler-of-the-Year tournament will be held on Dec. 11 at Holiday Bowl. It's open only to the 1987/1988 Bowler-of-the-Month winners. For more information, contact Dora Gunckel on 6-0835.

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.

MISCELLANEOUS

VOLVO RIMS w/snow tires, for 240 series car, $45; brass fireplace screen, $18. Montoya, 296-4268.

RANCH MINK SHORT COAT, size 14, $450; Haviland china, apple-blossom pattern, service for 12, serving pieces, $2000 retail, make offer. Chapman, 884-3067.

ANTIQUE ENGLISH BUFFET, circa 1850, walnut w/teak and rosewood inlaid wood, 5 beveled-glass mirrors. Gregory, 294-2749.

HOWARD PLAYER-PIANO, player mechanism needs restoration, $750. Duke, 298-4427.

TWO REVERSIBLE KING-SIZE BEDSPREADS, $8 & $15; twin-size matching quilted spreads, $20/pr.; twin-size flannel sheet, $5. Anderson, 268-4188.

KENMORE ELECTRIC DRYER, 9 months old, $230; Cinelli bicycle rollers, $45; Edsbyn cross-country skis, poles, woman's size 9 boots, $50. Smith, 275-9303.

SINGER SEWING MACHINE, $25; Gemeinhart silver piccolo, $110; 1/2" impact wrench, $55; Sioux air drill, 3/8", $25. Baca, 298-7748.

AMIGA 1000 COMPUTER, 512K, DOS Version 1.2, 2 disk drives, 1 monitor, TV adapter, $1000 firm. King, 821-4692.

MACH 128 CARTRIDGE, $19; Timeworks Money Manager and Electronic Checkbook, $5/ea., $8/both; GEOS 64, Version 1.3, and Geowrite Workshop, Version 2.1, $25. Stuart, 265-7315 after 5.

QUEEN-SIZE FUTAN, firm, cotton/polyester, $200. Scott, 898-9361.

EPIPHONE 12-STRING GUITAR, model FT-160N, made in Japan, $200. Strait, 842-1695.

TEKONSHA MARK 12 ELECTRONIC TRAILER BRAKE, used once, $50 OBO. Yeager, 898-7465 leave message.

COMPAQ COMPUTER, 386/16, 387 FPU, 40M 28MS HD, Herc monitor. Nichols, 275-1241.

TWO EXERCISE BIKES, pedal and/or row, flywheel, adjustable tension, speedometer & timer, $60/ea. Lieber, 298-1101.

'54 FORD F-100 PICKUP BODY, all parts included and in restorable condition, $2500 OBO. Bailey, 898-8055.

CHINESE CHAIR, Mandarin Ming-style, blackwood, calligraphic-design back, fitted blue cushion, $250 ('68 appraisal). Caller, 296-9331.

ENTERTAINMENT CENTER, L-shaped, all wood, recently refinished, $100 OBO. Ahr, 884-1470.

GI-JOE AIRCRAFT CARRIER, $20; Power Wheels, 4x4, $50 OBO; oil-filled heater, $20. Frytz, 296-3813.

DEC RAINBOW 100b PC, 896K memory, two 768K floppy drives, w/5 different programs, $900; louvered wooden doors, 24" wide, 80" tall, w/tracks, 2 sets, $75. Harris, 268-4432.

SHRADER EMPRESS WOOD STOVE, heats 2000 sq. ft., cost $695, sell for $300. Martin, 884-5213.

FREEZER, Sears, 6 cu. ft., $40; washer, Sears, 24" x 26", $40. Rhoads, 298-6157.

GIRL'S DESK, w/matching hutch, chair, nightstand, cream color, Dixie furniture, $250. Bundy, 821-1846.

CELLO, full-size German Schroeder, w/bow and padded case; 60-gal. fish tank, w/stand, $60. Brodie, 897-7528.

COFFEE TABLE, hexagonal, burlwood, beveled-glass top, brass trim, $200; 2-piece sectional couch, salmon, Leishman's, $300. Cuthrell, 764-0356.

TIRES: four 9.50x16.5 Hiway Tread, two 9.50x16.5 mud/snow tread, 1/2+ tread, $125/all. Tobyas, 877-0354.

HOLLMAN MOTORCYCLE BOOTS, size 10, $20. Lewis, 296-7896.

DP1500 ALL-IN-ONE HOME WORKOUT SET, $100; Sears treadmill, $50. Cochrell, 298-2068.

OSCILLOSCOPE, model O-10 Heathkit, $25; fluorescent magnifier lamp, $20; metal typewriter stand, $18; Rolleicord DBP camera, Xenar 1:3.5/75, $75. Shepherd, 299-9066.

SKI RACK, Barrecrafter Skyliner SR-12, holds 6 pair of skis, never used, $35. Rowe, 888-5971.

UPHOLSTERED BARREL SWIVEL CHAIRS, $40; restored Lawson sofa, $2000 value, sell for $400; IBM PC, keyboard, new monochrome monitor, $700. Sharp, 293-2055.

SKI BOOTS, Raichle, size 9-1/2 , model RX-7, rear entry w/forefoot tension adjustment, black w/red lettering, used one season, $120 OBO. Baca, 828-1914.

TIRE CHAINS for light truck, 7.00x15, new, never used, half-price, $28. Olsen, 294-2333.

PORTABLE ANIMAL PEN, metal frame, chain link, 6' x 8', 5'8" high, $125. McEwen, 291-9355.

SATELLITE TV SYSTEM: 7' fiberglass dish, Janeil receiver, Anderson converter, Avantek/Chaparral 100° LNA, 11' pole, $500. Hyde, 255-3452.

SILVER/TURQUOISE ITEMS: woman's squash-blossom necklace, $275; man's bolo tie, $20; man's size 10 ring, $45; man's belt buckle, $70. Sikora, 881-4741.

WOMAN'S NORDICA SKI BOOTS, $75; Fisher 170 skis w/Tyrolia bindings, make offer. Bassett, 897-4712.

UPRIGHT FREEZER, white, $175. Jaramillo, 898-3168.

HONDA PORTABLE GENERATOR, EX650, 110 VAC, 12 VDC, 650 watts, $150. Ewing, 268-6920.

PING-PONG TABLE, folds and rolls, $45; water skis, $10; backpack, $5. Harstad, 298-6551.

TRUCK TIRE, new, Uniroyal Laredo LT radial, 235/85R16, $50. Danneels, 292-1548.

PUPPIES, English setter/black Lab cross, black w/white feet & undersides, view now, $35; double-crested basklisk-basklisk reptile, 14" long, $35. Horton, 884-8989.

BLACK MALE CAT, declawed, neutered, 8 months old, free to good home. Larson, 299-2384.

SIBERIAN HUSKY PUPPIES, AKC-registered, ready Christmas week, sable/white and red/white, parents on premises, $200/ea. Marshall, 281-8436.

VIOLIN, 1/4-size, Nagoya Suzuki, w/hard case, $200. Bauer, 266-8480.

M-1 GARAND RIFLE, $350. Liguori, 256-3613.

TWIN-SIZE BED, teakwood, Teenset, w/shelved headboard and trundle, mattresses, $250. Kmatz, 299-5978.

CAMERA SET: Olympus OM-PC 50mm, 70-210mm lenses, flash unit, carrying case, new, half price. Carli, 298-9271.

BABY DWARF RABBITS, black & white, $15 delivered Christmas Eve, $12.50 you pick up; Baldwin walnut upright piano, $900. Freshour, 256-9168.

CUSTOM DRAPES, natural color, all hooks, Kirsch rod and hardware, 84" x 84", $45 OBO. Hines, 821-8592.

TELEMARK BOOTS, Asolo Extreme Pro, new, size 9-1/2, $175; Electro-voice speakers, 12", 2-way, $80/pr. Blake, 881-1663.

SPITZ PUPPIES (American Eskimo), white, 3 males, 1 female, 7 weeks old, $75/ea. Smith, 281-2940 after 5.

SMITH-CORONA PORTABLE ELECTRIC TYPEWRITER, includes 10-day touch-typing course. Sweet, 255-0255.

BELL & HOWELL POWER SUPPLY/FUNCTION GENERATOR; Leader oscilloscope; drafting table; all best offer. Gonzales, 266-2302.

STUDIO PIANO, Straube, $850; Beta tapes, swap for VHS; hanging lamp; portable GE oven; school desk. Mills, 299-2130.

COLLIES, AKC-registered, sable & white, show quality, ready to go. Rhoden, 293-5301.

QUEEN-SIZE BOX SPRING, Simmons Royalty, $50. von Riesemann, 822-0548.

PRINTER: CITOH 8510A dot-matrix, IBM-compatible, $85. Newman, 266-9418.

SILKY TERRIER, AKC-registered, male whelped 11-19-88, sire grandson of Int'l CH Lilac Blue Prince, $350/make offer. Coe, 294-5397.

CANOPY BED, $50; bunk bed, $50; dresser, $15. Romero, 299-8578.

CONSOLE COLOR TV, Sears 25", dark pine finish, $150. Pullen, 291-0666.

YAMAHA FULL-LENGTH KEYBOARD, model PSR-31, new, 61 keys, 16 voices, full rhythm section, auto bass, etc., $200 OBO. Homer, 836-5043.

ARROW STORAGE SHED, 9' x 9', tin, new, still in box, $80. Budlong, 298-1060.

PERSONAL COMPUTER, IBM-compatible by visual, 512K, amber monitor, 2 floppy drives, DOS, BASIC, other software, $575. Schofield, 292-7220.

LOWREY PAGEANT ORGAN, cost $4500, sell for $2000. McDaniel, 299-6189.

LAUNDRY TUB, triple-galvanized, $35; 4 closet doors, 36" x 78", $38; 15" tires, mounted. Pilat, 292-4727.

DREXEL FORMAL DINING-ROOM TABLE, 6 chairs, 2 leaves, solid inlaid pecan w/rattan accents, $500. Schofield, 268-8011.

CHOW-CHOW PUPPIES, AKC-registered, 3 females, 1 male, $200/ea. Carriaga, 873-3438.

BING & GRONDAHL CHRISTMAS PLATES, 1970-77, $30/ea.; free-standing wrought-iron fireplace screen, $20. Treadwell, 884-4221.

N-GAUGE TRAIN CARS, 32' of track, trestle, $20. Bruneske, 897-4721.

RCA COLOR TV, 19", no remote control, steel TV stand w/casters, $75. Pendall, 265-3008.

KITCHEN TABLE, wood-tone formica, w/4 chairs on casters, $149. Haushalter, 821-4138.

FURNITURE: twin-size mattress and box spring, $60; dark maple captain's chair, $45; bookcase w/louvered doors, $25. Sons, 294-3953.

DRAPES: steel-blue and antique-white tweed, sheers and rods included, 85" x 105", $40; 85" x 80", $25. Meyer-Hagen, 293-7339.

DYNACO TUBE-TYPE PRE-AMP, $40; two 175-watt Altec power amps, not working, $20/ea.; all for $60. Thorne, 884-4870.

MINIATURE DACHSHUND PUPPIES, AKC-registered, black & tan, ready for Christmas, $220. Puccini, 255-0568.

TRANSPORTATION

'78 MERCURY MONARCH, 8-cyl., AT, AC, cruise, AM/FM, $1150. Sanchez, 897-4514.

'86 OLDS. CEIRA BROUGHAM, 2-dr., bucket seats, V-6, 2.8-liter, AT, AM/FM, 32K miles, $7500. Chapman, 292-6877.

MAN'S 10-SPD. BICYCLE, Sears Free Spirit, 26" diameter tires. Rosul, 281-4114.

'78 LUND PIKE BOAT, 18', w/'82 Johnson 70-hp outboard engine, pilot's console w/lighted compass, power trim, extra built-in gas tanks, w/trailer and extras. Averill, 345-2236.

CRUISE AIR MOTORHOME, 27', no reasonable offer refused. Smith, 881-3580.

'77 MERCEDES BENZ 450 SL, coupe/convertible, new top, tires, stereo, and shocks, below book, $19,500. Eagan, 281-9589.

'81 YAMAHA VIRAGO 750cc, new battery, tires, and seat, helmet bags included, $1000; '76 Datsun pickup, king cab, $1100. Bott, 823-2821.

'84 YAMAHA FJ1100, 5K miles, extras, $2700. Baca, 298-7748.

'72 CADILLAC, loaded, uses regular gas, $750. Dumas, 268-3403.

'76 MERCURY BOBCAT, 302 V-8, C-4 AT, 9" rear end, red, $2500 OBO. Bailey, 898-8055.

'77 FORD 150 SERIES PICKUP, 25K miles on engine and clutch, 4-spd., AC, $1750. Tobyas, 877-0354.

'84 FORD THUNDERBIRD, fully equipped. Middleton, 299-6148.

'81 FORD FAIRMONT SW, PS, PB, 6-cyl., AT, 36K miles, $1500. Galloway, 281-5671.

34' AVION TRAVEL TRAILER, loaded; '87 Ford E250 XLT van, blue & white, towing-equipped. Bewley, 255-8024.

'85 AUDI 5000S, AT, AM/FM cassette, new tires, power sunroof and mirrors, silver blue exterior, blue interior, $8900. Jaramillo, 898-3168.

'74 HARLEY-DAVIDSON SPORTSTER, customized, chrome, saddlebags, more, $3200. Gonzales, 344-4933.

'78 FIAT X-19 CONVERTIBLE, 2-dr., gold & black, stereo, needs clutch, $1750 blue book, sell for $1300 OBO. Garcia, 888-4735.

'87 DODGE SHADOW, tilt, AT, AC, PS, PB, cruise, AM/FM stereo, rear defroster, 13.5K miles, 5-yr., 50K-mile warranty, $7000. Liguori, 256-3613.

'75 CHEV. MALIBU, 87K miles, 2-dr., 350 V-8, $750. Kelly, 293-2475.

'78 OLDS. TORONADO BROUGHAM, will consider all trades, $1595. Martin, 883-7236.

'86 HONDA CRX Si, white, 20K miles, AM/FM cassette, one owner, garaged, sheepskins, electric sunroof, alloy wheels, $8000 OBO. Behling, 898-7657.

MAN'S 12-SPD. RALEIGH MARATHON BIKE, 19" frame, new, ridden once, $170. Johnson, 293-3864.

CHILD'S BEGINNING BICYCLE, $25. Berman, 296-5640.

10-SPD. BIKE, Schwinn LeTour, best offer. Gonzales, 266-2302.

'84 TOYOTA TERCEL, 4-dr. hatchback, AT, AC, PS, PB, 77K miles, $3125 OBO. Smith, 892-2516.

'74 FORD LTD, cruise, PW, stereo, more, $975 OBO. Montoya, 883-9115.

'87 MUSTANG 5L GT, maroon and silver, 10K miles. Johnson, 296-1152.

'83 CHEV. EL CAMINO, w/Conquistador package, AT, fully equipped, burgundy. Olecksiew, 822-9584.

'85 MALLARD MMH, 26', fully loaded, retails for $23,800, sell for $22,500. Pullen, 291-0666.

'85 HONDA 150 ELITE SCOOTER, red, 6.7K miles, $500 OBO. Homer, 836-5043.

'81 HONDA SILVERWING MOTORCYCLE, $950. McDaniel, 299-6189.

SCHWINN BICYCLE, $65. Pilat, 292-4727.

'81 MERCURY CAPRI, bright bittersweet, original owner, $3450. Pfeiffer, 242-5316.

WOMAN'S SCHWINN 10-SPD. BICYCLES: red 27", $95; silver 24", $75. Bruneske, 897-4721.

'81 CHEV. EL CAMINO, AC, cruise, V-8, air shocks, AM/FM cassette, new tires, PS, tilt, AT, two-tone, $2200. Conklin, 1-864-0207.

'80 CHEV. SUBURBAN C10 SILVERADO, 9-passenger, AC, AM/FM stereo, tilt, cruise, 360 V-8, $4400. Loukota, 294-7353.

'85 CHRYSLER NEW YORKER, fully loaded, under transferable warranty. Thiermann, 299-0279.

'81 DATSUN 310GX, 4-dr. hatchback, 4-spd., 73K miles, $1800 OBO. Kavet, 299-1793.

'85 SUBARU GL WAGON, 5-spd., FWD, AC, loaded, 40K miles, original owner, $6000 OBO. Garcia, 292-0979.

MAN'S 10-SPD. BICYCLE, new Fuji Sundance Sparkler, list price $300, sell for $175. Bohn, 897-3135.

'72 VW BUS, $450; '65 VW bus, $1595; complete VW engine, 12V w/headers & new muffler, $200; '67 VW bus transaxle, $150. Thorne, 884-4870.

REAL ESTATE

2-BDR. TOWNHOME, 2-1/2 baths, 1400 sq. ft., Academy/Wyoming area, assume $372 PITI. Crowley, 898-7646.

2-BDR. TOWNHOUSE, near Old Town, 2 baths, 1200 sq. ft., garage, motivated seller will give $2000 towards down payment. Arfman, 823-1154.

FIVE ACRES, near El Morro. Olecksiew, 294-9710 or 298-5850.

3-BDR. TOWNHOUSE, 2 baths, 1426 sq. ft., foothills, security bars, view, assumable 9.5% FHA, paid $81,500 in 1984, sell for $84,900. Padilla, 299-2637.

3-BDR. HOME, LR, DR, den, sunroom, 1-1/2 baths, garage, masonry construction, landscaped yard w/sprinklers. Clauss, 266-9319.

WANTED

MANDARIN-SPEAKING PERSON for one half-hour session helping language student. Joseph, 299-6989.

CABBAGE PATCH DOLL DRESSES and accessories, in good condition. Wagner, 823-9323.

ACCORDION, piano, 48 to 120 bass, good condition, low price. Young, 884-7836.

EXERCYCLE, reasonably priced. Maxam, 898-2435.

CARPENTERS CHRISTMAS ALBUMS, borrow for recording. Lockwood, 821-6331.

COLOR COMPOSITE MONITOR for Commodore 64, prefer 12" to 14" diagonal screen. Treusch, 897-3521.

AIRLINE DOG-SHIPPING CONTAINER, large size. Underhill, 294-5774 after 6.

APPLE IIe or II+, cheap or donated, for mid-school gifted class. Carlson, 898-3666.

CLEAN CLOTHING for poor people in the area of St. Helen's Church in Portales. Montoya, 883-9115.

OVEN AND CENTRIFUGE for jewelry making. Hill, 275-7415 or 836-2752.

ROTTWEILER, AKC-registered, female to breed w/AKC Rottweiler male. Chavez, 839-9830.

BOOKINGS of string quartet for parties, church services, weddings, etc. Mora, 255-3089.

LOST AND FOUND

LARGE BLACK-LEATHER PURSE, w/shoulder strap, taken from car, reward, P.O. Box 5564, 87185. Browne, 884-0345.

SCARF, kelly green, 100% wool, lost on Nov. 16 inside Tech Area I. Perez, 275-1192.

WOMAN'S WATCH, Bulova Caravelle, gold w/black strap, lost on Nov. 18 between Bldg. 802 and Wyoming parking lot. Parrott, 255-3614.

Annual Christmas Party Set for Next Friday Night

GET IN THE SPIRIT OF THE SEASON next Friday night (Dec. 16) at the C-Club Christmas celebration. The evening begins with a two-for-one special dinner (cost for two: $19.95). Elegant entree choices are filet mignon or fried shrimp; dinner includes salad-bar selections and a half litre of house wine. Afterwards, it's dancing to the mellow music of the Bourquet Brothers from 8 p.m. to midnight. Reserve your space with a call to the office (265-6791).

MONDAY MEANS MUG NIGHT — because Marlon (the bartender) will fill up your brought-from-home, up-to-24-oz. mug with beer for just 50 cents. How's *that* for a deal, Monday-night football fans? Other main-lounge events this month include Ladies Night, Dec. 14 (the distaff side gets frozen drinks for $1.50); Corona Nights, Dec. 15 and 22 (you-know-whats available for $1.25, 4-9 p.m.); Membership Appreciation Night, Dec. 20 (card-carrying types get a free well drink); and Nacho Night, Dec. 21 (nachos just $1.50).

THE BRUNCH BUNCH is back in business on Sunday, Dec. 18, and about time — right, folks? To start things off, everyone receives a free glass of champagne or house wine. From there, it's on to the bountiful buffet, with its extended menu: scrambled eggs with shrimp, pancakes, omelets, bacon, baked ham, roast turkey (with stuffing), mashed potatoes and gravy, steamed veggies, fruit salads, an appetizing array of desserts, and more. And now hear *this*: All this good eating (from 10 a.m. to 2 p.m.) costs just $6.95/adults and $3.50/kids (4 to 12 years old). Better make that reservation ASAP.

CORONADO SCHUSSBOOMERS get together this month on Dec. 20 in the ballroom. Following social hour at 7 p.m., speaker Don McIntyre (DOE) kicks off the 7:30 meeting with a slide show and talk, ''Skiing on the Equator.'' Then the ''Rough Riders,'' who know for a fact that life begins at 50, will let the young pups in on the secrets of their skiing success. Topping off the evening is a ski-fashion show sponsored by Oshman's. There's also an opportunity to sign up for this season's CSC trips to exotic places — and a chance — as always — to win one of those fabulous door prizes.

CHIEF CAKE CUTTER at the C-Club's reopening celebration Nov. 18 was President Irwin Welber. Club manager Sal Salas looks on.

WHAT ARE YOU DOING NEW YEAR'S — New Year's Eve, that is? How about heading for the C-Club's barn-dance blast? Tickets are on sale right now for ''hello-1989'' high jinks, featuring a prime rib or fried shrimp dinner (served from 7 to 10 p.m.), including salad bar, baked potato, and vegetable; a bottle of champagne served with continental breakfast at midnight; and all sorts of party favors and noisemakers. Shuffle and stomp away the night — and 1988 — to the c/w tunes of (who else?) those good old Poor Boys from Isleta (9 p.m.-1 a.m.). Cost for all this merriment, which starts at 6, is only $38/couple; last day to pick up tickets is Dec. 23. Better hop to it, because this one is always SRO.

DON'T WORRY 'BOUT A THING — If you're planning a special private party, wedding reception, retirement party, luncheon, or pool party, the spiffy new C-Club facilities provide the perfect place. Just give catering manager Maggie Pappas a call (265-6791); she'll help you plan that special event down to the very last detail.

Events Calendar

Dec. 9 — ''Christmas in the Land of Enchantment Ball,'' March of Dimes benefit sponsored by the Albuquerque Downtown Jaycees; 9 p.m.-1 a.m., Convention Center, 888-8477.

Dec. 9-10 — ''Christmas Joy,'' dance program presented by The Performers, a group of dancers between the ages of 11 and 17; 8 p.m., Rodey Theatre, 298-5551.

Dec. 9-10 — Concert, ''Mentor & Protégé,'' New Mexico Symphony Orchestra conducted by Neal Stulberg performs music by Bach, Walton, and Tchaikovsky, featuring Josef Gingold and Corey Cerovsek on violins; 8:15 p.m., Popejoy Hall, 842-8565.

Dec. 9-22 — ''A Poetic Vision: Spanish Colonial Painting,'' exhibition of religious paintings from the 17th-19th centuries, on loan from the Institute of Iberian Colonial Art; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues.; UNM Art Museum, 277-4001.

Dec. 9-Jan. 20 — Exhibit, ''Alexander Masley: Calculated Abstractions''; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. evenings; Jonson Gallery, 277-4967.

Dec. 11 — Christmas concert, Albuquerque Concert Band, presented by the Albuquerque Parks & Recreation Dept.; 2 p.m., KiMo Theatre, free, 848-1374.

Dec. 11 — ''This Day,'' Christmas cantata by R. Vaughn Williams, performed by the Albuquerque Civic Chorus; 7:30 p.m., St. John's Episcopal Cathedral (318 Silver SW), free.

Dec. 14-24 — ''Much Ado About Nothing,'' comedy by William Shakespeare, performed by the New Mexico Repertory Theatre; 8 p.m. Tues.-Sat., 2 p.m. Sun.; KiMo Theatre, 243-4500.

Dec. 16 — ''A Christmas Festival,'' concert of Christmas music presented by the New Mexico Symphony Orchestra; 8 p.m., Kiva Auditorium, 843-8565.

Dec. 16 & 18 — ''Lo, How A Rose,'' Christmas music from the Renaissance and Middle Ages, performed by Musica Antigua de Albuquerque; 8:15 p.m. Fri., 4 p.m. Sun.; St. Thomas of Canterbury Episcopal Church (425 University NE), 842-9613.

Dec. 22 — ''The Reluctant Dragon,'' Christmas concert presented by the Santa Fe Desert Chorale; 6 p.m., Keller Hall, 1-988-7505.

Dec. 23 — Christmas concert, presented by the Musica De Camara Ensemble; 8 p.m., First United Methodist Church (4th & Lead SW), 243-5646.

Congratulations

To Lisa and Sam (3734) Jones, a daughter, Danielle Alyce, Oct. 13.

To Patti and Victor (1231) Harper-Slaboszewicz, a son, Adam Victor, Oct. 29.

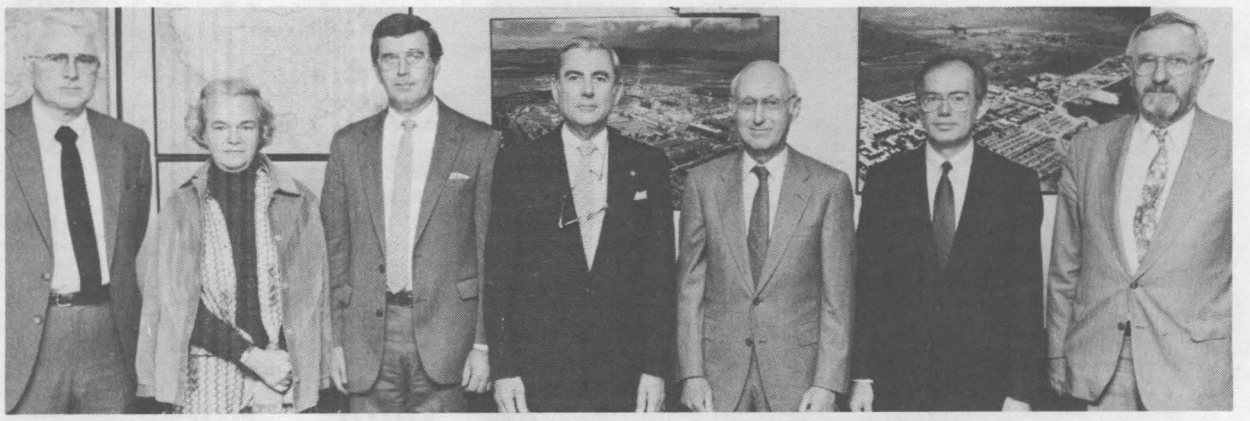
To Robyn and Doug (2341) Bentley, a son, Aaron Douglas, Nov. 18.

To Brenda (1551) and Jon (7542) Rogers, a son, Jason Daniel, Nov. 19.

To Kathleen (DMTS, 7223) and Carl (1412) Diegert, a son, Evan Vickers, Nov. 26.

Sympathy

To Mary Ryan (7500) on the death of her husband in Albuquerque, Nov. 19.



FIVE AMBASSADORS to the Conference on Disarmament recently visited Sandia for discussions on nuclear testing and arms limitation verification, nuclear weapon development and testing, short-notice inspections, and other topics. Shown (from left) are Max Friedersdorf, US; Tessa Solesby, United Kingdom; Roger Hagengruber (9000); A.W.J. Robertson, Canada; Sandia President Irwin Welber; David Reese, Australia; and Robert van Schaik, Netherlands.