

SUPERNET: Supercomputer Performance From Small Computer Network

A Sandia-Livermore-developed parallel-processing technique, SUPERNET, coupled with a Yale-University-developed software package, Linda, promises to help reduce Sandia's current computing crunch.

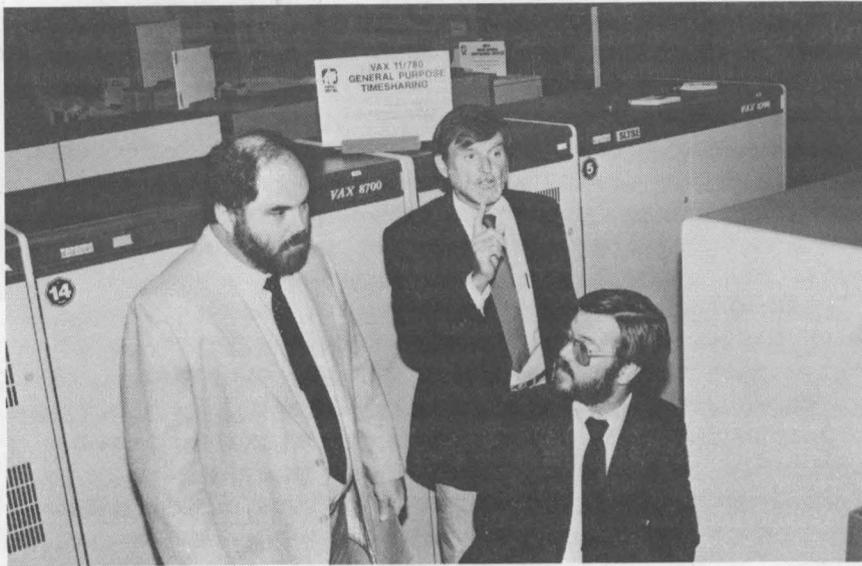
SUPERNET/Linda links Sandia's existing mini-computers to form the equivalent capacity of one or more supercomputers. On some applications, SUPERNET performance approaches, or even surpasses, that of a Cray-1S supercomputer.

It's a timely breakthrough: Even though they run 24 hours a day, Sandia's mainline supercomputers — five Crays, including two X-MPs — are overburdened, "and we cannot afford to buy supercomputers as fast as we need them," says Ron Detry, Director of Engineering Design 8200.

At the same time, the Labs has significant computing capacity in the more than 300 minicomputers of VAX 11/780 size or larger in its distributed network, many of which are not fully utilized outside normal working hours. (They are "distributed" in the sense that these VAXes are "owned by" and used by the technical organizations in which they're located. It is a "network" in that most of them are interconnected by communication links to each other and to the big computers, such as the Crays, in either SNLA's or SNLL's Computer Centers. And the two Computer Centers are, in turn, connected to each other.)

Solved Problem Twice as Fast as Cray-1

"We've now achieved proof of principle on SUPERNET," says Bob Whiteside, the computer scientist in Scientific Computing and Applied Math Div. 8233 who headed SNLL's SUPERNET project team.



SOME SUPERNET PRINCIPALS — Joe Harris (8233, left), Bill Wilson (8230), and Bob Whiteside (8233). Bob worked with a Yale University computer scientist to adapt Yale's software system, Linda, to SUPERNET.

"We linked the 14 VAXes in our network — 3 of them in Livermore, 11 of them 1100 miles away in Albuquerque — and used them in a parallel-processing mode [in which each computer is assigned only a part of the overall computation; see LAB NEWS, March 11, 1988]. To allow each VAX to communicate with the others, we used the Linda software program. It proved itself to be a powerful, generic parallel-processing tool that can be used to insulate the user from much of the underlying computer architecture.

"Our tests show that, with SUPERNET, we can solve one major, real-world application problem — a rocket plume simulation analysis using the CHARM code — in 143 minutes. That's twice as fast as on the Cray-1S."

Another test problem took twice as long as a Cray — 151 minutes for a semiconductor radiation-

strike model using the BOHR code on SUPERNET, 74 minutes for the same problem on the Cray. Still another problem involving a thermal-analysis code (TACO 3D), which demanded the exchange of massive amounts of data between processors, achieved only six percent of Cray performance.

"The performance results of the thermal-analysis program demonstrate the limitations of this type of parallel processing," notes Joe Harris, 8233 supervisor. "Many applications will run poorly on SUPERNET. It's not a replacement for traditional supercomputers.

"But our goal is not to try to exceed supercomputer performance," Joe adds. "It's to achieve supercomputer capability by fully utilizing existing minicomputers. SUPERNET allows a large R&D lab such as Sandia to make round-the-clock use of its exist-

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SUPERNET: Its Implications For Sandia

If its early promise is realized, SUPERNET should expand Sandia's computing capacity significantly — without major expense and without major headaches. "Other Sandians — specifically, computer system managers — are most helpful in dealing with the administrative matters involved," says Bob Whiteside (8233). "At this point it's somewhat tedious for a new user to contact all the system managers and get added to their machines as another user account. Tedious, but not difficult — almost everyone who has a VAX on the network has cooperated.

"SUPERNET gets charged just like any other user," Bob continues. "By selling SUPERNET some computer time at night when the machines are normally idle, a system manager can lower rates for daytime users. So far, our study has used only the 14 big VAXes, but later we'll probably use the smaller ones as well."

On the technical side, those who want to use SUPERNET must learn Linda — "a simple enough task for a programmer," says Bob. They must also modify their programs — "parallelize" them — to utilize the network. Depending on the problem to be parallelized, that modification may be easy or difficult.

And the rewards should be worth the effort: "For the right class of problems, Linda/SUPERNET offers the potential for reducing some of the load on our supercomputers," says Larry Bertholf (2600). "Furthermore, using the VAXes more frequently means more efficient use of the resource. And that means lower daytime rates for VAX users.

"In effect, everyone should win."



LAB NEWS

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SANDIA NATIONAL LABORATORIES

JUNE 3, 1988

New Policy Effective Aug. 1

Smoking Prohibited in 'Common-Use' Areas

On Aug. 1, Sandia will implement a new smoking policy that, in essence, prohibits smoking in all buildings and facilities except where it's specifically permitted. It's the reverse of the current policy, which allows smoking in all areas except where it's prohibited. And it's a step toward the goal of an eventual "smoke-free workplace."

The new policy will apply to all Sandia employees (some 10 percent of whom are smokers), visitors, and contractor employees.

As described in SLI 1900-1 (which will be issued before the implementation date), no tobacco products will be sold on Sandia premises, and smoking will be prohibited in all "common-use" areas. These include (but are not limited to) restrooms, hallways, auditoriums, elevators, libraries, stairways, aisles, classrooms, conference rooms, copier rooms, and company vehicles.

Smoking will be allowed only in areas with "Smoking Permitted" signs. An employee with an "individually enclosed" office — floor-to-ceiling walls and a door — may designate it a Smoking Permitted area by posting a sign. Employees sharing an office or workspace "are to come to a mutual agreement concerning smoking or no-smoking." If they

(Continued on Page Eight)



AN ENDANGERED SPECIES

Antojitos

Speeder Nabbed in Tech Area -- After a brief low-speed chase, Security Capt. Bill Wolf (3434) succeeded in pulling over a vehicle clocked by Bill's radar gun at 24 mph on 9th Street in Tech Area I on May 23 at 1118 hours (speed limit inside the Tech Area is 15). Once Bill approached the driver's door, he realized that he'd just stopped President Irwin Welber.

"I was pretty embarrassed," Bill reports, "but he was most gracious as I gave him his warning. He did say he hadn't noticed any speed limit signs."

"Just a coincidence, of course, but we're now considering more signs -- signs that say the speed limit is radar-enforced these days."

* * *

According to My "Deep Throat" Intelligence Source, Yale software developers began work on Linda, a new parallel-processing system (see SUPERNET story), shortly after the DoD had named its new computing language Ada, for Augusta Ada King, Countess of Lovelace (1815-1852). The abandoned daughter of the poet Lord Byron, Ada was a mathematician who has been called the first computer programmer -- she created a program for Charles Babbage, who built the first prototype of a digital computer in the 1830s.

"If the DoD can name its new language after one Lovelace," reasoned the Yalies, "we can name ours after another."

* * *

More on Supercomputing -- Referring to (but mangling the facts of) 1400's parallel-processing speedup achievement, *Regardie's* (a Washington, D.C.-based newsletter) ran this paragraph under the heading "Brave New Joystick": Scientists at Sandia National Laboratory in New Mexico say they've developed a new supercomputer that can function 1,000 times faster than a normal computer. This breakthrough means that in the future a typical game of Donkey Kong will take only .24 seconds instead of four minutes and that home supercomputer users will become bored with their new purchase in 4.32 hours instead of the usual six months.

* * *

No Longer Just a Pipe Dream? -- Given the new smoking policy and the talk of a "smoke-free workplace," this stolen statement starts making sense: "Someday, smoking will be a vice engaged in only by consenting adults in the privacy of their own homes."

* * *

Parking Problem: Old as the Stalls -- "Those who feel that the more attractive parking spots are things 'you can't hardly get no more' will find their problems simplified if an experimental plan on parking space assignment proves workable" (LAB NEWS, April 8, 1955). Apparently it didn't.

* * *

Tempted to Use That Last Sentence Myself Sometimes! -- A not-all-that-technical article on Bert Tise's (2533) digital tactile sensor (LAB NEWS, April 22) in *Chemical & Engineering News* ends, "Tactile data will also be integrated with data from other types of sensors, such as vision sensors, to keep the robotic system's attention on the overall task. It's all very complicated." ●BH

* * *

They also serve who only set bad examples. (Attributed to Iben Browning, former Sandian)

Events Calendar

June 3-12 -- "Lost and Found Traditions, Native American Art 1965-1985," national traveling exhibit organized by the American Federation of the Arts; 10 a.m.-5 p.m. Tues.-Fri., 1-5 p.m. weekends; Albuquerque Museum, 243-7255.

June 3-19 -- "A Girl's Guide to Chaos," adult comedy by Cynthia Heimel about four women whose social situations are far from their expectations; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

June 3-July 17 -- "Mexico Nueve: A Suite of Lithographs," exhibit of 18 lithographs pulled at Tamarind Institute, featuring original prints by contemporary Mexican artists; regular museum hours, Van Deren Coke Gallery, UNM Art Museum, 277-4001.

June 3-July 22 -- Annual Summer Raymond Jonson Exhibition, selected works from the Jonson Reserve and Estate collections featuring abstract landscapes; regular museum hours, Jonson Gallery (UNM), 277-4001.

June 3-July 24 -- "New Traditions: Thirteen Hispanic Photographers," exhibit of works by New York-based photographers from Chile, Cuba, Colombia, Venezuela, Spain, Brazil, and North America; regular museum hours, upper gallery, UNM Art Museum, 277-4001.

June 4 -- Duke City Jamboree: Trio Grande, High Desert Dancers, Jacob's Ladder, Rockin' W Ramblers, Miguel Caro with Mexican Fiesta Dancers, Linda Collier, Carthy & Whelan, and Lynn Gottlieb; 2:30 p.m., KiMo Theatre, 848-1370.

June 4 -- June Music Festival Concert I: Guarneri Quartet performing works by Mozart, Schubert, Webern, Wolf, and Sibelius; 8:15 p.m., Woodward Hall (UNM), 881-0844.

June 4 -- Summerfest '88: Italian Night, food and entertainment; 5-10 p.m., Civic Plaza, 768-3490.

June 5 -- Concert, Albuquerque Municipal Band; 3 p.m., KiMo Theatre, free, 848-1374.

June 6 -- June Music Festival Concert II: Guarneri Quartet, with guest violist Atar Arad performing works by Beethoven, Barber, and Dvorak; 8:15 p.m., Woodward Hall (UNM), 881-0844.

June 7 -- Concert, Chamber Orchestra of Albuquerque directed by David Oberg, featuring harpsichordist Igor Kipnis; 8:15 p.m., St. John's United Methodist Church (2626 Arizona NE), 881-0844.

June 8 -- June Music Festival Concert III: Guarneri Quartet, with guest pianist Lilian Kallir performing works by Mendelssohn, Schoenberg, and Schumann; 8:15 p.m., Woodward Hall (UNM), 881-0844.

June 8-11 -- "Turning," world premiere by La Compania de Teatro de Albuquerque, play in poetry by Demetria Martinez that examines the lives of three New Mexican Latinas who challenge the 1980s by crossing borders -- geographical, emotional, political, and intellectual; June 8 performance is a fund-raiser for the NM Sanctuary Defense Committee; 8 p.m. Wed.-Sat., 2 p.m. Sun.; tickets are \$4 for Sandians and guests during the run of the play (reg. \$6), KiMo Theatre, 242-7929.

June 10 -- June Music Festival Concert IV: Guarneri Quartet, with guest soprano Lucy Shelton performing works by Beethoven, Villa-Lobos, Fauré, and Schumann; 8:15 p.m., Woodward Hall (UNM), 881-0844.

June 10-12 -- Demonstration, Gabrielita Nave of San Juan Pueblo will make a hand-embroidered manta (dance skirt); special event for Lost and Found Traditions exhibit; 10 a.m.-2 p.m. Fri., 1-5 p.m. Sat.-Sun.; Albuquerque Museum, 243-7255.

June 11 -- Juneteenth celebration, performance and workshop by Newchild Productions; 3-6 p.m., South Broadway Cultural Center, free, 848-1320.

June 11 -- Summerfest '88: Scandinavian Night, food and entertainment; 5-10 p.m., Civic Plaza, 768-3490.

June 12 -- June Music Festival Concert V: Guarneri Quartet performing works by Haydn, Shostakovich, and Beethoven; 3:15 p.m., Woodward Hall (UNM), 881-0844.

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Deaths



brother and a sister.

Gary Brown of Fusion Technology Div. 6514 died May 17 in a plane crash that also took the lives of his wife, daughter, and parents.

He was 31 years old.

Gary had been a member of the technical staff since May 1984.

Survivors include a

* * *



David Dolan of Computer Security Div. 2612 died suddenly May 24.

He was 46 years old.

David had been a member of the Labs staff since January 1980.

Survivors include his wife, daughter, two sons, and mother.

Record Participation in Directorate Challenge



AND THEY'RE OFF — John Crawford (8000) fires the starter's pistol, and the Directorate Challenge pack surges forward.

A record 324 runners and walkers turned out on a hot May day for the 5th annual Sandia Directorate Challenge. The previous high turnout was 190.

Holding on to the gold cup for largest number participating from any one directorate was Ron Detry's 8200 — 144 people. Second place went to 8300, and third to 8500.

In the run itself — 2000 metres beginning east of Bldg. 912, up the hill and around Bldgs. 916 and 927, and back to Bldg. 912 — perennial first-place winner Jim Reitz (8141) took the men's award. Ellen Ochoa (8435) captured first among women. Second-place winners for men and women were Bob Powers (8435) and Karen Sheaffer (8235); placing third were Glenn Kubiak (8343) and Donna Edwards (8234).

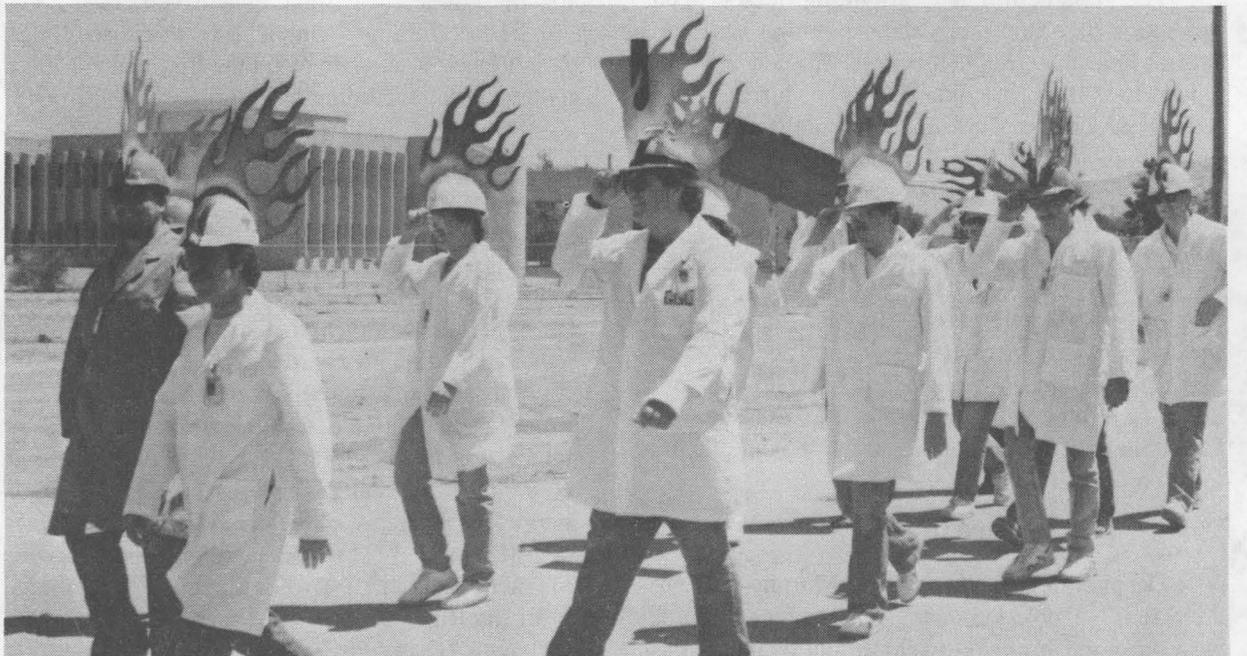
Some special awards went to costumes and group entries this year. "Best Group Costume" award went to the Combustion Research Facility's Turbulent Diffusion Flames. A threesome of golfers from 8285 took the "Most Unique Entry" prize. Tied for "Best Centipedes" were the Computing Center's Daisy Chain and Rohde's Rowdies from 8310.



ROHDE'S ROWDIES formed a centipede led by Department 8310 Manager Dick Rohde (left).



TOP RUNNERS Ellen Ochoa (8435) and Jim Reitz (8141) received their trophies from race coordinators Dan Dawson (8243) and Barry Bolden (8161, right).



TURBULENT DIFFUSION FLAMES from the Combustion Research Facility won the Best Group Costume award.



MOST UNIQUE ENTRY was this threesome of golfers (from left) Nick Wittmayer, Bob Pilkey, and Jay Petersen (all 8285), who golfed their way along the route.



DAISY CHAIN centipede entry from the Computing Center led by Joe Brazil (8236) included labels on each flower.

Glass Ceiling Keeps Women from Top Positions, Says Women's Program Speaker

Because of EEO, Affirmative Action, and changed attitudes, women are no longer subjected to overt or covert discrimination in the workplace — right?

Wrong. Those who subscribe to this myth are simply ignoring the existence of the "glass ceiling," according to Joellyn Murphy, VP of regulatory and business policy at PNM.

Murphy, one of the government's 150 most highly placed women when she served as director of various federal agencies in Washington, D.C., spoke on "Cutting Through the Glass Ceiling" at a recent Coronado Club luncheon sponsored by the Women's Program Committee.

Transparent Barrier

"The glass ceiling," says Murphy, "is the transparent barrier that keeps all but a handful of exceptional women from rising above a certain level in an organization."

Despite the growing numbers of women in the labor force — and on technical staffs and in middle management — women are not moving into the upper ranks of US corporations in any noteworthy numbers or with appreciable speed. "With few exceptions, they have hit the glass ceiling," notes Murphy.

Consider these statistics:

- Only 2 percent of corporate officers in the US are women;
- Only 4 percent of the 12,000 directors of America's largest corporations are women;
- Only 1 percent of women earn more than \$50,000, compared to 9 percent of men.

The glass ceiling is the dividing line between promotion based on merit and promotion based on extraordinary accomplishment. "Women are still judged by a double standard," says Murphy. "We are still expected to have more strengths and fewer faults than our male colleagues. To progress, a woman's performance must be exceptionally and consistently outstanding. Only truly extraordinary women break through the glass ceiling today and reach the very top."

But isn't there a glass ceiling for men? Not all men become CEOs (Chief Executive Officers). "Yes, that's right," says Murphy, "but some do. Enough do, in fact, to be 99.77 percent of all CEOs today in US publicly traded corporations — 6485 out of 6500 to be precise."

Beware the Sirens

Despite all these facts, says Murphy, "There are Sirens — 'post-feminists' — who would lure us away from the struggle to achieve our goals, just as the mythical Sirens — charming creatures who lived on a Mediterranean island — tried to lure Odysseus and his crew onto the rocks by singing seductive songs.



JOELLYN MURPHY, VP of regulatory and business policy at PNM since 1984, came to N. Mex. from Washington, D.C., where she served as deputy director of the Bureau of Land Management. In Washington, she also served as budget director for the Environmental Protection Agency and as director of the Coastal Energy Impact Program for the Department of Commerce. At age 32, she was elected to serve a five-year term on the Board of Trustees of Stanford University.

"They fill our ears with things we'd so like to believe," cautions Murphy: " 'Women don't have difficulties in the workplace anymore.' Or 'Women are really accepted today as equals.' Or 'Women are now poised for a new round of achievement.' "

These alluring — but deceptive — Siren songs have created a number of myths that women must contend with, according to Murphy.

Myth of Unlimited Potential

Chief among them is the Myth of Unlimited Potential — the one that says "A woman can now be anything she wants to be; no barriers are so impenetrable that a strong-willed woman can't break them down, and if she fails to break them down, it's only because she didn't try hard enough."

"This myth is false for two reasons," says Murphy. "One is that all of us have limited abilities — not all of us are qualified to be a CEO, even if all of us wanted to be one. The other is that the myth ignores the existence of the glass ceiling."

Murphy's most unpleasant confrontation with this myth came in 1981 when she was deputy director of the Bureau of Land Management, an agency of about 6000 employees. She was responsible for a budget of about \$1.5 billion in expenditures and more than \$12 billion in revenues.

"Secretary of Interior James Watt sent me the message that my job was going to be 'reorganized'

because he was 'uncomfortable with such a young woman in such a responsible job.'

Myth of Meritocracy

Another myth that Murphy has confronted is the Myth of Meritocracy — the one that says "Work hard and you will be justly rewarded."

"More likely," says Murphy, "you'll only be recognized as a hard worker working harder."

This myth, she says, "is clearly part of the reason that one woman out of every four is leaving the middle ranks of corporations today to start her own business or to join a small firm. Most are being both pulled out and pushed out: pulled by more interesting and rewarding alternatives outside the corporation; pushed by the physical and emotional exhaustion that comes from consistently meeting extraordinary expectations and bumping against the glass ceiling."

As budget director of the Environmental Protection Agency (EPA), Murphy worked long hours and most weekends, she says, "for a crazy boss." He would do such things as ask her to come back to the office at 11 p.m., after a 12-hour day, to polish a memo to the file. "Unfortunately, I was even crazier than he was, because I would come back."

But she thought that after all her hard work, quality results, and exceptional efforts to meet his expectations, she would surely be justly rewarded. "I was wrong," she says. She finally left EPA.

True Test of Equality

The true test of whether women have equal opportunity, says Murphy, "is how far an average woman can go, not whether a few extraordinary women can get very close to the top.

"I can't praise women's victory against overt and covert discrimination," she continues, "until we see two changes in the corporate world: first, many more women occupying top positions, and second, as many average women holding as many responsible positions as average men hold."

This isn't likely to be soon, according to Murphy. Citing a recent study by the Center for Creative Leadership acknowledging the inevitability of the "ascent of women into top management" and predicting that "women will take top management posts . . . within the next fifty years," she adds, "I don't know about you, but I'll be dead by then, and my daughter will be retired.

"Being judged by a double standard isn't fair," says Murphy, "but it will be our reality for a few more generations. Make peace with the unfairness, and concentrate instead on demonstrating exceptionally and consistently outstanding performance.

"But," she concludes, "don't use this peace-making as an excuse to escape your responsibility to work toward a fairer world for everyone." ●DR

Sympathy

To Lester Harris (5231) on the death of his father in Breckenridge, Tex., April 15.

To Paul Demmie (9141) on the death of his father in Pittsburgh, April 23.

To Steve Romero (2114) on the death of his mother in Albuquerque, May 19.

Anyone For 55?



Compared with Europeans, we look like gluttons for work. American men generally consider 65 an ideal age for retirement, less ambitious than the 70 most often cited by Japanese males. But, say Stanford sociologists Alex Inkeles and Chikako Isui, British and French men would rather turn in their papers when they reach 60. And, in retirement, the Americans and Japanese want to live off their savings, while the Europeans expect to depend more on social-security checks.

Selwyn Feinstein, *Wall Street Journal*

FOR THE FIRST TIME EVER, Sandia hosted the annual DOE Classification Officers Conference, held May 17-18. Here, conference planner Judd Hollister (3180, right) and Bryan Siebert, DOE Acting Director of Classification and Technology Policy, discuss the meeting agenda between sessions. Sixty-six classification experts from around the DOE complex attended the conference.



SUPERNET

ing minicomputers — linking them in parallel and using them in parallel — to solve very large and complex scientific problems that one minicomputer alone simply could not handle.”

“For some applications, SUPERNET represents a substantial increase in computing capacity,” adds Bill Wilson, manager of Computation Dept. 8230. “If the concept were applied nationwide, the development could save the hundreds of millions of dollars it would take to purchase an equal amount of additional computer capacity.

“Even for those applications for which SUPERNET is inefficient, it provides a valuable resource because it uses our existing hardware,” Bill continues. “In other words, it helps us achieve cost savings in our computing activities.”

Linda: Parallelizes Without Paralyzing

The key to SUPERNET’s performance is a software system called Linda, a high-level approach to parallel processing. That is, it enables scientists and engineers to “parallelize” applications for computers without concern for the underlying computer architecture. The user can concentrate on designing the problem while Linda coordinates the communication and synchronization among the various parts of the computation.

Linda was developed in the early 80s by Yale University computer science researcher David Gelernter, along with Nicholas Carriero and Jerrold Leichter. Although Sandia has been working with Yale for several years, the Linda/SUPERNET project began just this last December as a joint research venture among Sandia Livermore, Scientific Computing Associates, Inc. (SCA), and Yale University. Yale’s Jerrold Leichter, who developed the VAX version of Linda, worked with Sandia’s Bob Whiteside to install the SUPERNET system.

“SUPERNET is an excellent example of the type of achievement that is possible through the collaborative efforts of American universities, industry, and government,” says Bob. “The Linda Project at Yale provided the fundamental research necessary for Linda’s commercialization by SCA, which was

Hypercube in March, SUPERNET in May

The computing speedup reported by Computer Sciences Dept. 1410 in March (LAB NEWS, March 11) and Computation Dept. 8230’s SUPERNET are related achievements only in that both involve creative approaches to parallel processing. That means that a computational problem is divided into pieces small enough to be handled by several relatively small processors or minicomputers working simultaneously to solve the same large problem.

But 1410’s achievement was a research effort, designed to increase the computational power of supercomputers and to advance the frontiers of understanding in the parallel-processing arena. By scaling up the size of the problems attacked to match the number of processors involved, and by parallelizing problems so that all the processors work at the same time, speedups of 1020, 1019, and 1011 times were demonstrated on three different problems. These numbers approach the theoretical limit of 1024 (the total number of individual processors in the NCUBE/ten hypercube computer used); it’s currently the world’s largest computer of its type.

Dept. 8230’s achievement, on the other hand, is more a development effort. SUPERNET shows that a small network of ordinary already-in-house VAX minicomputers, with the right software plus innovative approaches to parallel

programming, can match or surpass the performance of a Cray supercomputer in solving some problems.

“Our goal is to provide increased capacity for current production computations,” says Bob Whiteside (8233), who headed the SUPERNET project team. “Therefore, absolute execution time, rather than relative speedup, is the appropriate performance measure. SUPERNET permits the near-term use of parallel-processing techniques without access to — or knowledge of — an exotic parallel computer.”

“I think the Linda activity is important in easing the crunch we expect in the next couple of years,” says Larry Bertholf (2600). “Linda is also important because it serves as an introduction to the larger numbers of processors expected on future supercomputers.”

“The research done by 1400 demonstrated the impact parallel processing could have on problems that are very important to Sandia,” says Ron Detry (8200). “Bob Whiteside recognized that Linda, if implemented on our distributed network, could provide a simple way for our computer users to apply parallel processing. By building on work done at Yale and SCA, Bob and his colleagues have leveraged a small investment in development into a major computational opportunity.”

in turn applied to real engineering problems by Sandia.” SCA, of New Haven, Conn., is a private company founded by Yale scientists.

“Linda is actually a small set of programming constructs for describing the ‘parallel’ part of a parallel program,” Bob adds. “The idea is that these Linda constructs can be added to other, non-parallel programming languages — Fortran, for instance — to enable parallel processing.

“A very important aspect of the Linda approach to parallel processing is its portability,” Bob continues. “Linda has been implemented on a wide variety of parallel computers, including hypercubes, shared-memory multiprocessors, and Sandia’s network of VAXes. Thus, one goal of this research is to enable the same parallel program to run on either a Cray-XMP, a hypercube, or on SUPERNET — or even on all at once.” ●BH/KFrazier (3161)

Supervisory Appointments



EDWARD WILLIAMS, JR., to supervisor of Equipment Maintenance Section 7812-4.

Ed joined Sandia’s Plant Maintenance and Operations Department in October 1973 as a member of the mechanical apprenticeship program. After graduation in 1978, he joined the Maintenance Operations Division, where he worked as a refrigeration mechanic. Ed was a planner in Maintenance Operations Planning Div. 7815 from 1980 until his promotion.

His spare-time activities include fly-fishing and fly-tying. Ed and his wife Nadine (7522) live in the NE Heights.

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BERWEIDA LEARSON to supervisor of Management and Staff Development Div. 3523, effective May 1.

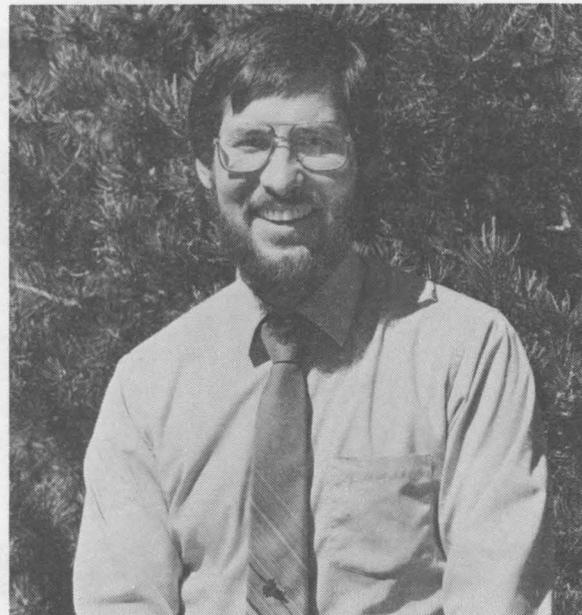
Berweida joined the Labs in August 1974 as a

secretarial trainee. In 1975, she became the secretary for the Systems Studies and Applied Mechanics Division. In 1978, she joined the Tech Writing Division as an MAS trainee. She went to the Education and Training organization in 1980 as a training consultant. In 1984, she became the INTEC program coordinator. She has worked as an instructional design specialist in the development of the Professional Staff Orientation program since 1986.

She has a BS in French and secondary education from Loyola University in New Orleans and an MS in speech communication from UNM. She has represented Sandia in United Way campaigns as a Loaned Executive and training consultant.

In her spare time, Berweida enjoys family activities, teaches a Sunday school class, leads a Bible study group, participates in the International Training in Communication organization, and plays tennis.

She and her husband Lacey (3428) have two children and live in the NE Heights.



JEFFREY LENBERG to supervisor of Payload Test Development Div. 9215, effective April 1.

From June 1980, when he joined Sandia, until his promotion, Jeff was a member of the Satellite Systems Division. His work included satellite test-software development and satellite digital-logic design. Most recently, he was project leader for development of a new-generation satellite tester.

He has a BS and an MS, both in EE, from UNM. While in college, he did aircraft simulator hardware design for NASA under a cooperative education program.

Jeff’s spare-time activities include playing racquetball, helping friends with their personal computer systems, and helping with the TV ministry at his church.

He and his wife Dana have two daughters and live in the NE Heights.

Stockpile Reliability: Major Mission of Texas Sandians

It's not shake, rattle, and roll — in the usual sense.

However, the weapon testing conducted by Sandia's Weapons Evaluation Test Laboratory Div. 7264 at its Pantex location outside of Amarillo, Tex., includes a little of all three — plus zaps, spins, and other forms of torturous testing treatment.

Div. 7264's primary responsibility is to ensure the reliability of the US nuclear stockpile by lab-testing, on a random-sample basis, both new and stockpiled weapons (as opposed to "weapon systems," which include delivery systems, software, people, etc.). LAB NEWS recently visited the 25,000-sq.-ft. lab, home every day for 21 division members, that's tucked away in a corner of the heavily secured Pantex nuclear weapon assembly plant operated by Mason and Hanger.

A 'Lab Like No Other'

"This lab is like no other in the [DOE] complex," says division supervisor Len Parsons, a 22-year veteran at the Pantex site. "We have state-of-the-art test equipment — unduplicated elsewhere — that's designed to subject each major weapon, in a programmed test sequence, to the environments it would encounter in actual use; at the same time, we check out all its capabilities."

"You might say we go out of our way to look for problems," adds Bill Peters (7264-1), one of the division's two section supervisors. "Our job is to spot, analyze, and report any defects that could affect weapon reliability."

Currently, that job involves testing 28 different weapon types — at a yearly rate of about 300 weapons (which are subjected to some 900 systems tests and 1500 component/subsystem tests).

Production technicians at Mason and Hanger remove the nuclear assembly from each sample weapon before it's tested, explains Earl Morris, 7264-2 section supervisor. "The people doing the removal make checks and measurements at each step to record the 'as stockpiled' condition of the weapon," says

Earl. "The remainder of the weapon, assembled into a test bed that resembles the actual weapon, is then delivered to us for simulated system testing.

"In the meantime, the nuclear assemblies are examined and tested separately by either LANL or LLNL."

Equipment Worth \$70 Million

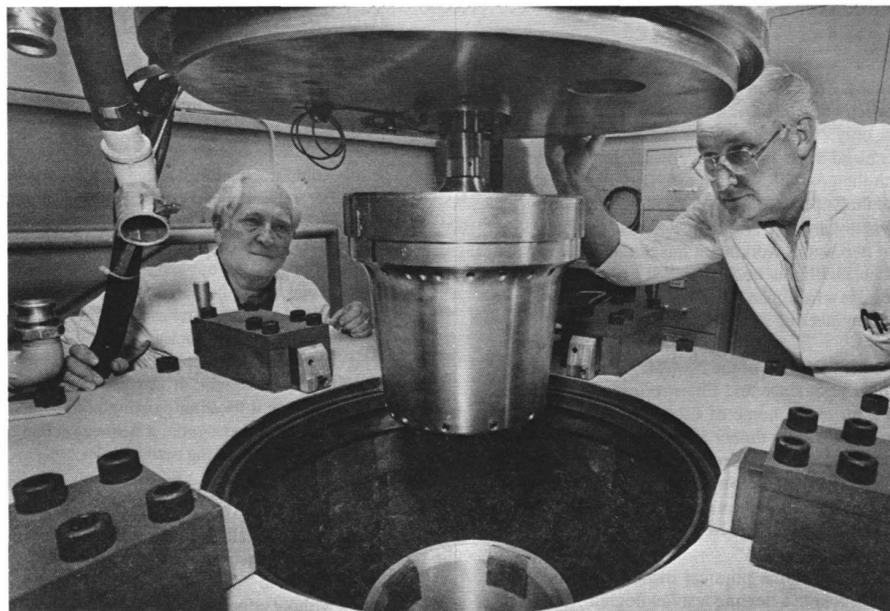
Equipment in the 7264 lab is currently valued at \$70 million, according to Len. A sister division, Systems Test Equipment Design Div. 7265, designs the test gear — tailored specifically for each weapon type — used by the Texas Sandians.

That special equipment includes 28 weapon electrical system testers; two fast-rise centrifuges that subject test items to g (gravity) loads of up to 50,000 lbs.; two spinners (300 rpm and 25,000 rpm); eight temperature chambers; and hundreds of items of specialized test and commercial electronics gear. High-speed digital data-acquisition systems are used to record and analyze test results before they're forwarded to concerned Labs organizations and the SNLA data bank.

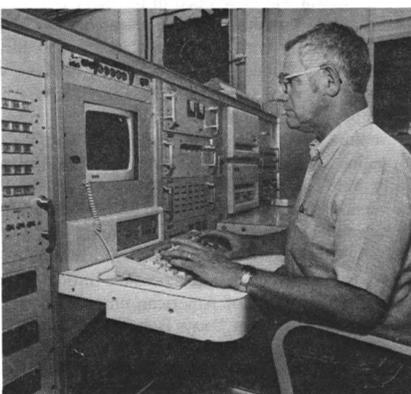
"Every weapon has unique testing aspects," says Len. "At the same time, however, we can use some of our equipment for certain tests on more than one system; for example, some of the same gear is used for testing the W80 and W84 cruise missiles."

Len says he's seen some definite changes during the time he's been at the Pantex site — for example, the automation of data-recording and analysis equipment. "Automation speeds up the tests, improves the accuracy of results, and lessens the possibility of human error," Len says. "Also, because of advances in electronics, we've seen about a 10-fold improvement in tester accuracy."

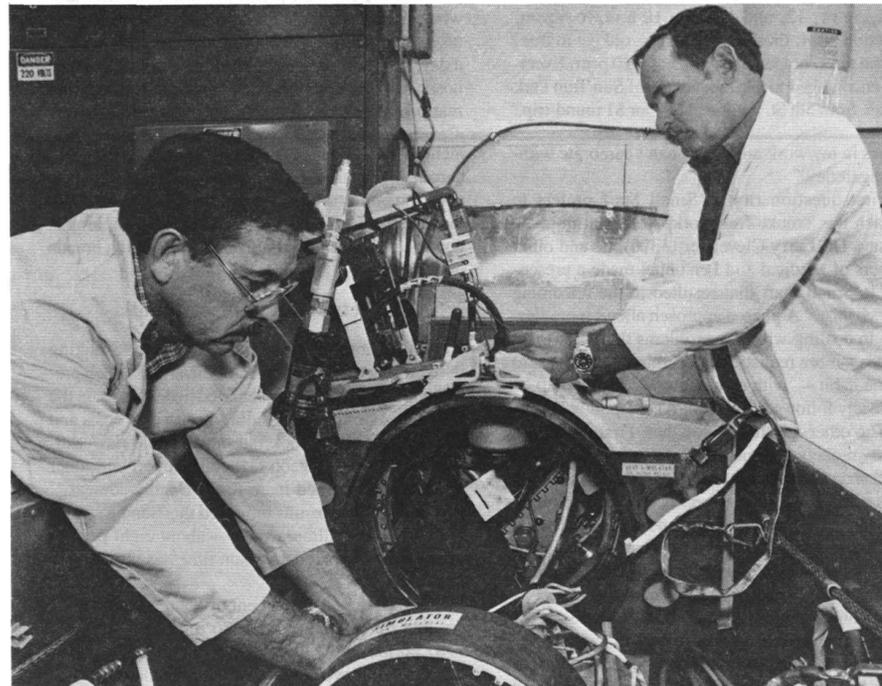
There's one more message for the folks back home in Albuquerque, Livermore, and Tonopah: "Just tell 'em 'Yes, Virginia, there really are Sandians in the Texas Panhandle,'" says Len, with a grin. ●PW



GARY SWAGERTY (right) and Dick Terwilliger lower a 200-lb. W79 test package into an air-driven spinner, where it will rotate at speeds up to 10,000 rpm — a rotation speed similar to the one a 155-mm artillery shell would experience when fired from a gun barrel. The spinner's maximum capability is 25,000 rpm.



OPERATOR CHUCK COLLIER, at the centrifuge controls, prepares for a test.



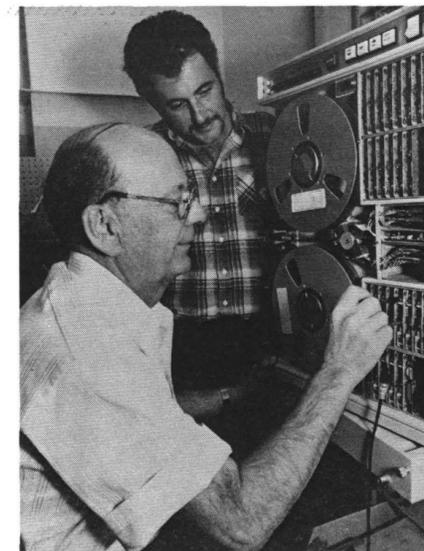
BOB PACHECO (left) and Larry Hill connect a weapon simulator to a B83 test system. Simulators are used to prepare for tests of actual systems, explains supervisor Len Parsons, because "tests on the real thing are — obviously — one-shot, and can't be repeated." Sometimes it takes days to prepare for an actual test that takes only seconds to run.

Introducing Some Members of Div. 7264 — 'Going out of Their Way to Find Problems'

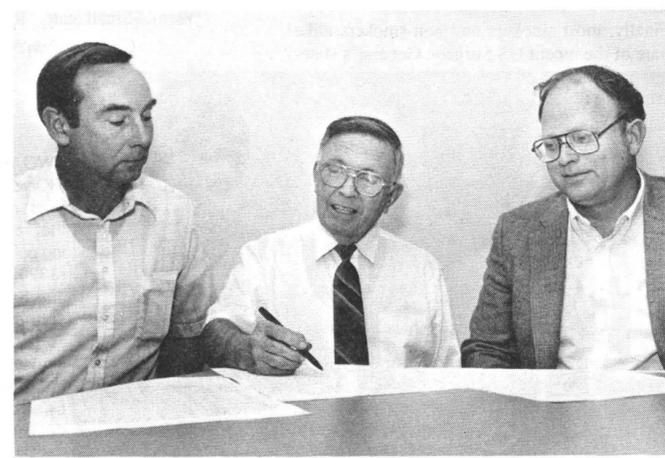
(Photos by Randy Montoya, 3162)



JIM GODFREY (left) and David Wesley disassemble a B61 test unit after checking its electrical components.



JIM HAWKINS (foreground) and Keith Vollmer analyze data tapes from joint-interface lab tests — systems tests done elsewhere. Joint-interface tests check out Sandia-designed DOE packages and military adaptation kits.



DIV. 7264 SUPERVISORS get together for a planning session: (from left) Earl Morris (7264-2), Len Parsons (7264), and Bill Peters (7264-1).

Take Note

Al Romig (1831) will receive the Burton Award for 1988 from the Electron Microscopy Society of America (EMSA) at its annual meeting in August in Milwaukee. The award is given yearly by the EMSA Council to the most promising electron microscopist under 35 years of age, and alternates between the physical sciences and biology.

Ron Iman (6415) recently received the 1988 Don Owen Award presented annually by the San Antonio Chapter of the American Statistical Association (ASA) and Marcel Dekker Publishing Company. This award is presented to a statistician in the Texas, New Mexico, Louisiana, and Oklahoma region who embodies the accomplishments of Don Owen. Don Owen, formerly a member of the Reliability Dept., left Sandia in 1964 to become chairman of the Statistics Department at Southern Methodist University; he's now a professor emeritus. This is the sixth time the award has been given, but the first time it's been given to a statistician outside of Texas. The award consists of a plaque and a check for \$500.

Hugh Church (6321) recently received the American Lung Association of New Mexico's Clinton P. Anderson Award in recognition of his efforts as a member of the City-County Air Quality Board.

Patricia Salisbury (3510) was recently elected to the 1988 board of the Tierra del Sol Council of Camp Fire, Inc.

For the second consecutive year, Pat Baca (3437) has received the Outstanding Youth Community Service Award from Youth Development, Inc., a United Way agency. The award recognized her continuing efforts in the State Legislature on behalf of troubled youth, and for her volunteer work at Youth Development, Inc. Pat, who represents Dist. 21 in the Legislature, was also recently appointed by Gov. Garrey Carruthers to the State Task Force on Adolescent Pregnancy.

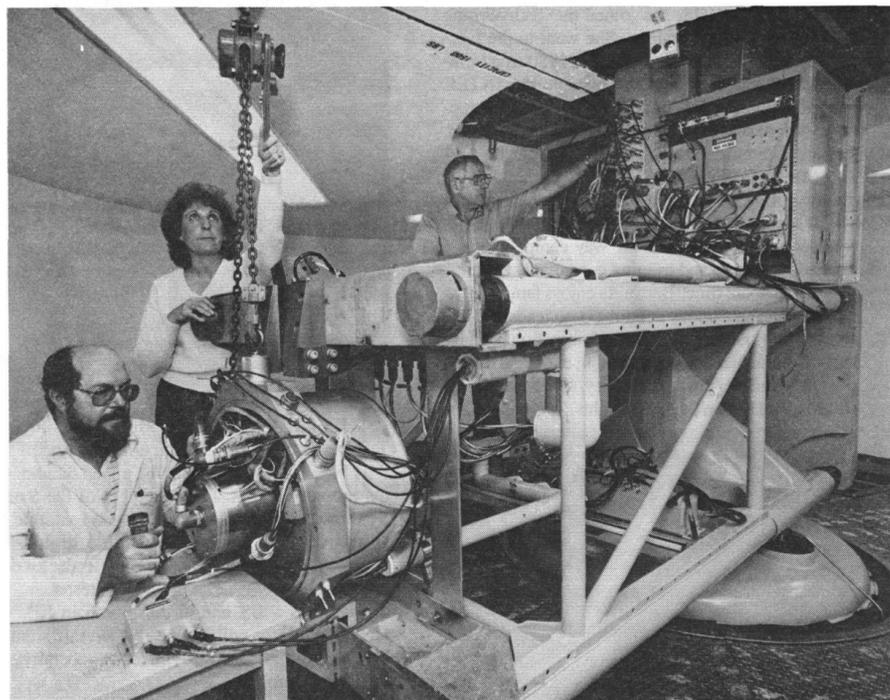
Kent Meeks (5164), a member of Sandia's Specialized Engineering Development program, has been named outstanding graduate electrical/computer engineering student for 1987-88 by UNM's Dept. of Electrical Engineering/Computer Engineering.

David Greher (son of Larry, 4010) was recently named a 1988 Presidential Scholar. A graduating senior at Albuquerque Academy, David, 18, spent the month of May as an intern in Sen. Pete Domenici's Washington office as part of the Albuquerque Academy Senior Project Program. He was a finalist for National Merit Scholarship, member of the Cum Laude Society, New Mexico Scholar, finalist in the New Mexico state math contest in 1987 and 1988, finalist in the 1988 AIME math contest, winner of the Albuquerque Association of Mathematics Teachers "Number Sense" contest, and member of the State Champion Science Olympiad Team. He was also on High Honor Roll for 15 consecutive marking periods, and won a 1987 Spanish Heritage Summer Scholarship. He will attend Duke University in the fall.

Two of the winners at the 1988 International Science and Engineering Fair in Knoxville, Tenn., on May 13 were children of Sandians.

Tom McGovern (son of Doug, 5267), a 16-year-old junior at Eldorado High School, won the third-place prize of \$200 in the behavioral and social sciences category for his project, "Angular Position Estimation Under Conditions of Restricted Field of View."

Heather Dawson (daughter of Ralph, 1141), an 18-year-old senior at Albuquerque High School, won the fourth-place prize of \$100 in the chemistry category for her project, "Non-Stoichiometric Growth Effects in the Alum/Chrom Alum Alloy System."



AN EIGHT-FOOT-LONG CENTRIFUGE — one of two in the 7264 test lab — goes from creep to full speed (270 rpm) in 300 milliseconds; the fast-rise capability duplicates gravity (g) forces that a weapon might experience during in-flight maneuvers. Here, Fred Trussell (left), Marilyn Higley, and Chuck Collier mount a W87 test assembly on the centrifuge before a test. The machine, used to test 23 different weapon systems, subjects test items to g loads of up to 50,000 pounds.

A Saturday Night Party for Everyone

Gather the family and head for the Rio Grande Zoo for a round of pleasures on June 18 from 6 to 10 p.m. at the sixth annual "Saturday Night Wild at the Zoo."

"This year there's more of everything," says John Gardner (3153) who rounded up and coordinated the entertainment for the event. "It's like a huge renaissance fair." John, who has years of experience in local theatrical productions, was responsible for coordinating the entertainment for Sandia's ECP campaign productions.

Continuous live entertainment is offered on two stages, including the new band shell. Clowns, magicians, mimes, and the Chili Brothers will stroll the grounds. The Society for Creative Anachronism again offers an opportunity for trying your hand against a knight in combat.

In addition to the entertainment, many choices of ethnic food will be available. And that's not all. There's a raffle for a trip for two to Hawaii as well as other trips, and a children's animal mask contest.

Several other Sandians are also involved in making this a wild night. Jerry Wymer (7525) will perform with the Fiasco Brothers, Mark Jenkins (1113) will provide magical entertainment, and Wacky Wizard Bill Fienning (5142) will stroll the grounds. Bob Colgan (3153) is in charge of gate security.

"Some of the the money raised in previous years was used to purchase the Victorian-style lights on the zoo grounds that will illuminate this year's festivities," says John. "This year's funds will be used



"SATURDAY NIGHT WILD" entertainment chairman John Gardner (3153) directs your attention to the annual benefit event at the Rio Grande Zoo.

to finish the band shell and will go toward the new sea lion exhibit."

Tickets for the event are on sale at the zoo on June 4, 5, 11, 12, and 18 from 10 a.m. to 4 p.m. Admission is \$4; those under 11 yrs. old get in free. Advance ticket holders may enter at 5:30 p.m. Everyone is encouraged to take advantage of Sun Tran Park and Ride from 5th St. and Lead SW for \$1 round-trip.

Paul McArthur (son of Dave, DMTS, 6421) has been participating in DOE's "Superkids" program; he's the only New Mexican in the group of nine American and international students taking part. He was with the group in Washington, D.C., in March to attend the Superconducting Supercollider Conference, where they met President Reagan. Last year, he spent two weeks working at the National Accelerator Lab in Illinois under the "Superkids" program. Paul is a freshman at the University of Illinois studying engineering and physics.

* * *

The next meeting of the New Mexico Network for Women in Science and Engineering is on June 15 at 6 p.m. at the home of Ellen Cronin (6330). The evening includes dinner and guest speakers Ed Sager and Yunzhi Li. There's a \$5 charge for dinner. Meetings are open to members and nonmembers. For more information, call Donese Mayfield (9224) on 4-8811 or Jennie Negin (3140) on 4-8765.

* * *

Although routine physical exams for Sandia employees include a hearing test (audiogram), their dependents may be interested in the "Dial A Hearing Screening Test," a free public service offered by the audiologists at Family Hearing Centers. The telephone hearing screening test permits you to screen your hearing from the privacy of home or office anywhere within the Albuquerque calling area, can be taken as often as you like, and is available 24 hours a day, seven days a week. The screening is not diagnostic and is not recommended for children. For information on the test, call 293-HEAR.

(Continued from Page One)

Smoking Policy

choose to allow smoking, Smoking Permitted signs should be posted. If not, no signs are necessary.

"Supervisors are responsible for resolving differences between smokers and non-smokers in their organizations," the SLI goes on. "Supervisors are expected to make reasonable efforts to accommodate both non-smokers and smokers. However, no major expense is to be incurred to establish a smoking area. In cases where agreement cannot be reached among the work force nor accommodation made without major expense, the issue is to be resolved by designating the area as a non-smoking area."

Okay, that's essentially the policy. At this point, anti-smoking readers are probably asking, "If the ultimate goal is a smoke-free workplace, why not go all the way — outlaw all smoking on the premises?" And the born-to-inhale folk are asking, "Can I quit?" or "How am I going to convince the non-

smokers in my work area that I can't celebrate without a cigarette?"

First question first. "Small Staff prefers to approach the 'smoke-free workplace' goal in phases," says Dr. Larry Clevenger (3320); he and other members of Medical and Personnel made a presentation to Small Staff that resulted in the upcoming policy change. "A phased approach allows more flexibility in dealing with any problems that may arise, provides a more realistic opportunity for smokers to kick the habit — with or without Medical's help — and closely follows the current AT&T policy."

The other question is tougher. First of all, not all non-smokers are anti-smokers — just because a smoker shares a work space with non-smokers doesn't necessarily mean the space *must* be a non-smoking area. Smokers, non-smokers, and their supervisor are expected to work together to arrive at decisions acceptable to both groups — mindful that, without agreement, the area will be non-smoking.

Second, the policy says that "supervisors are expected to make reasonable efforts to accommodate both non-smokers and smokers"—enclosed spaces can be designated "Smoking Permitted" areas, and so forth. Smokers will not have to journey outdoors for a cigarette, as a general rule — though that may be necessary in some locations (the supervisor will decide whether such journeys are nonproductive use of time).

Finally, most smokers and non-smokers alike are aware of the recent US Surgeon General's state-

ment that nicotine is just as addictive as cocaine and heroin. In discussions of how to implement the new smoking policy within a group, that fact should help to make the point with non-smokers that smoking is not an easily discarded habit akin to changing brands of perfume.

Effects of Smoking on Sandia

In addition to national trends (see "Smoking in Workplace" story), the Medical/Personnel presentation to Small Staff attempted to demonstrate the effects of smoking on Sandia's health care costs and absence rate. "We took the 'attributable-risk' estimates from the Surgeon General's report and other sources, and applied them to the Sandia context," says Larry. "The results indicated that Sandia spends more than \$2 million a year — about eight percent of its health care dollars — on illnesses attributable to smoking.

"Only about 10 percent of Sandians are smokers, but during the April 1986 through September 1987 period, more than 50 percent of Sandia Albuquerque employees with 60 or more days of sickness absence were smokers," Larry continues. "And those absences cost Sandia some \$180,000 in salaries for people who were unable to work because of lung cancer [3 employees], respiratory disease [4], or heart disease [17].

"We told Small Staff, 'To accept people dying in

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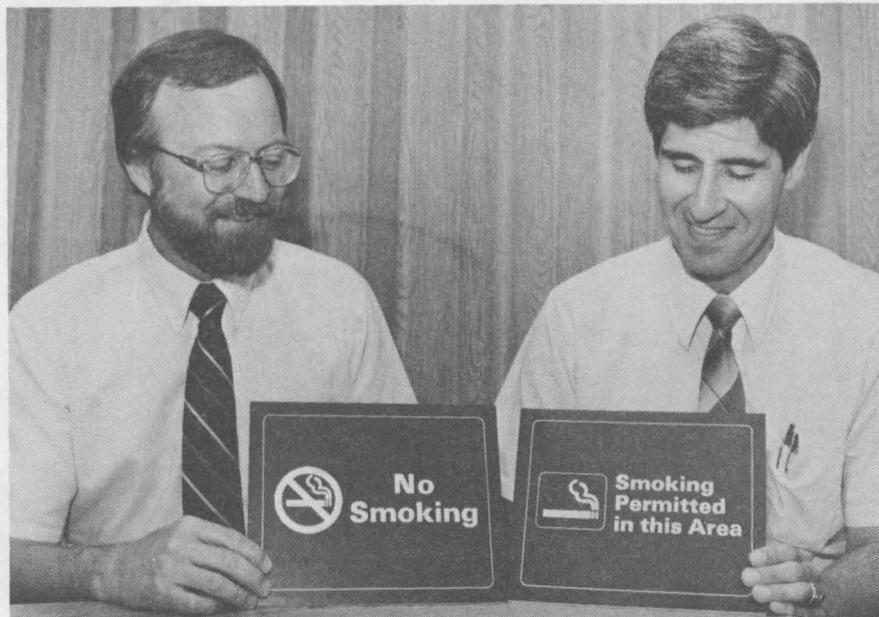
SNLL Moves Quickly

Sandia Livermore plans to move as quickly as possible in implementing the new smoking policy and in becoming a smoke-free workplace.

"We've created a committee [under Beverly Kelley, 8526] of both smokers and non-smokers to explore some creative ways to implement the policy," explains Paul Brewer, Director of Administration 8500. "We hope to phase in the policy with a series of steps — step one might be the restrooms, step two another area, and so on, so that by August 1, we're fully in compliance with the policy.

"We're a smaller group out here," Paul continues, "and, in general, we can respond to changes rapidly. Even our smokers seem to be in favor of the change. And, finally, we live in a state that already has restricted smoking in almost all places, public and private — such as grocery stores — where people gather.

"I expect few problems out here."



TWO SANDIA ORGANIZATIONS played key roles in the presentation to Small Staff that resulted in a new smoking policy. Dr. Larry Clevenger (3320, left) of Medical, and Jay Sanchez (3533) of Personnel (representing Marv Torneby, 3530) hold the new signs that will be available from Tech Art before the policy's Aug. 1 implementation date.

their 50s of lung cancer or other smoking-related diseases is not an acceptable option," and they agreed," Larry reports. "It was the boost our new policy needed."

The new policy should enable supervisors of divisions faced with smoking-related problems to come up with a decision and have it supported by policy. "Until now, each supervisor was responsible for resolving any conflict with only limited guidance as to how to go, with no really effective way to deal with the issue," says Marv Torneby, manager of Personnel Dept. 3530 and a member of the group that developed the new approach. "The policy provides an approach to dealing with conflicts."

"We don't expect major problems in implementing it," Marv continues. "The national and the local climate is right — which is to say that social values have evolved to the point that smoking is not a practice that is generally accepted by most of our population. Most Sandians — smokers and non-smokers — are mature people who can be expected to work out problems rationally."

Some Challenges Ahead

"At the same time, we don't expect the policy to become a part of Sandia's corporate culture without some challenging issues," says Marv. "Battle lines get drawn quickly between smokers claiming a right to smoke anywhere and anti-smokers claiming a right never to be within smelling distance of a burning cigarette. I believe that few Sandians fall into either of these categories. I certainly hope that's true."

"Yes, the new SLI mentions disciplinary action for someone who persists in disregarding the policy," Marv continues. "But I consider the issue analogous to our dress code—it shouldn't cause major problems."

"An important point is that the Personnel Department and each of the personnel representatives are a major resource here. They're prepared to assist supervisors who face conflicts in implementing the new policy."

To complement the policy, Medical will step up its health-education and smoking-cessation efforts, notes Susan Harris (3330). When it comes to quitting smoking, "different things work for different people. For would-be quitters — employees and spouses — Medical already plays a kind of clearinghouse function, offering some programs and steering them to other resources in the community."

"But we may add Nicorette-user support groups and other programs," Susan adds. "Even so, the quitting-smoking process is not easy, and the statistics on quitting are not impressive — thanks to nicotine's addictive nature and the fact that most of Sandia's remaining smokers are the hard-core types."

The 'Condition-of-Employment' Issue

None of the 30,000 or so people ever hired by Sandia was told that the Labs had any major restrictions on smoking, much less that Sandia would ever become a "smoke-free workplace." At the same time, none of them was ever told that conditions of employment could not change over the years. "So we don't expect any valid claims by either smokers or anti-smokers along that line," says Marv.

"Recently, however, we added a paragraph to our standard letter to prospective employment candidates," Marv continues. "We briefly summarize the new policy and point out the possibility that Sandia will become a smoke-free workplace sometime in the future."

Because the policy is a "change to past practice," Labor Relations Dept. 3450 is currently bargaining the issue with the unions. ●BH

Smoking in Workplace: Controversial Issue

"Smoking in the workplace has been, and continues to be, a controversial issue," says the March 1988 issue of the *AT&T Journal*. "The Surgeon General of the United States and many research scientists have concluded that smoking can be dangerous to the health of both smokers and non-smokers. As a result certain states and localities have enacted legislation to regulate smoking in public places, including the workplace."

Sandia's new policy, like that of AT&T, was developed to:

- address the Surgeon General's concern about smoking;
- address concerns of both non-smoking and smoking employees;
- maintain a healthy work environment; and
- assist management in dealing with concerns expressed by both non-smoking and smoking employees.

Sandia has been working toward an eventual smoke-free workplace for some 10 years. During that time, evidence that smoking adversely affects the health of both smokers and non-smokers (the "passive smoke" issue) has continued to mount. "Most of the data are epidemiological [related to the causes, distribution, and control of the spread of a disease or condition throughout a population], and most of the data on the 'passive smoke' problem derive from families of smokers," says Larry. "Our presentation to Small Staff [which resulted in the current policy change] included a brief discussion of the conclusions drawn by the 1986 report by the Surgeon General on 'The Health Consequences in Involuntary Smoking.' The three major conclusions are:

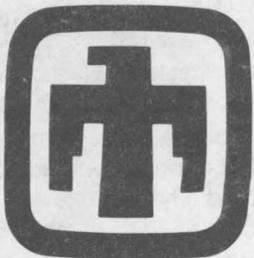
1. Involuntary smoking is a cause of disease, including lung cancer, in healthy non-smokers;
2. The children of parents who smoke, compared with the children of non-smoking parents, have an increased frequency of respiratory infections, increased respiratory symptoms, and slightly smaller rates of increase in lung function as the lung matures.
3. The simple separation of smokers and non-smokers within the same air space may reduce, but does not eliminate, the exposure of non-smokers to environmental tobacco smoke.

"We went ahead to point out to Small Staff that 'smoking is guilty of being the leading preventable cause of disease and death in this country,' according to Surgeon General Koop, and that smoking causes 300,000 premature deaths annually — 80 to 90 percent of emphysema/chronic bronchitis deaths, 80 percent of lung cancer deaths, and 33 percent of heart disease deaths.

"Even though few people remember the numbers, these kinds of data have changed the climate in the country when it comes to smoking," Larry continues. "With greater public awareness of the problem, we've seen a trend toward more conservative philosophies and more visible restrictions on smoking. That's true in the workplace too, as more and more companies have restricted, or even eliminated, smoking — and as those restrictions have held up in the courts."



PRESIDENT WELBER hosted presidential candidate Jesse Jackson in Bldg. 980 and PBFA II last week. Here, Irwin uses a model of the TOSI (Technical On-Site Inspection) facility to make a point about Sandia's treaty verification program. At right is former NM Governor Toney Anaya, a member of Jackson's campaign staff; next to him is AL Deputy Manager Jim Culpepper.



The Swiftest Traveler Is He That Goes Afoot

Eubank Walker Identified

*Afoot and light-hearted I take to the open road,
Healthy, free, the world before me,
The long brown path before me leading
wherever I choose.*

— Walt Whitman

Lyle Davis (2113) chooses the path along Eubank to walk into work.

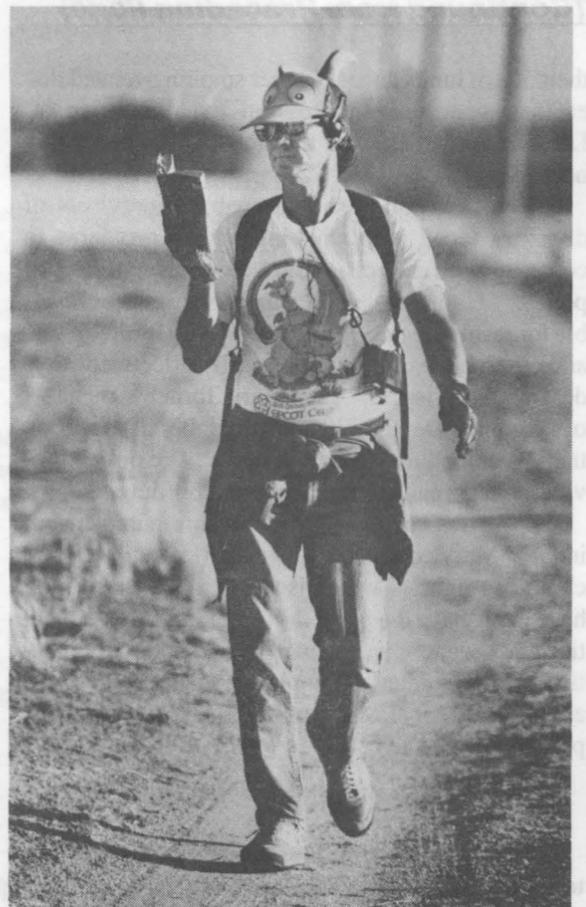
Lyle is a familiar figure to the drivers in the "stop-and-go" traffic headed for the Eubank gate. He can often be seen marching along, book in hand,



BUSY PEOPLE — Participants in the Career Exploration Program (CEP), a work-study program sponsored by Sandia and the Albuquerque Public Schools, work at SNLA afternoons during the academic year and attend high school classes in the morning. CEP gives the student interns — all selected by APS from its Gifted Student Program — an opportunity to explore various career options while earning academic credit for the work experience. Sandia benefits too, says program coordinator Soila Brewer (3533): "Our CEP people, all technically oriented, do useful and productive work for the organizations to which they're assigned," she says. Sandia's five CEP participants during the past school year — all high school seniors — recently lined up for a photo at the PBFA I "sculpture" in Area IV. From left, they are Kristina Stewart (1275, Sandia H.S.); Kimberly Haulenbeek (7537, West Mesa); Denise Hunter (7535, West Mesa); Stacy Kraushaar (1251, Cibola); and Kyle Coachman (1245, Valley). They'll continue to work (full-time) at Sandia this summer before heading off to college in the fall.



FOR THE FIRST TIME, Sandia won the Distinguished Prime Contractor of the Year Award from the Small Business Administration's Region VI (New Mexico, Arkansas, Louisiana, Oklahoma, and Texas) and will compete for SBA's National Distinguished Prime Contractor of the Year award for 1987. The regional award, presented last week by Joe Pena, Director of Region VI (right), recognizes Sandia's achievements in supporting SBA's prime missions — raising the percentage of total dollars subcontracted to small (and socially disadvantaged small) businesses and managing programs designed to assist socially disadvantaged small businesses. Jon Bedingfield, supervisor of Supplier Relations and Purchasing Information Div. 3731, accepted the award on behalf of Sandia.



THIS IS HOW ONE SANDIAN GETS TO WORK. Not missing a step (or a word) on the dirt road that parallels Eubank Blvd. from Southern Ave., Lyle Davis (2113) heads for the Eubank gate.

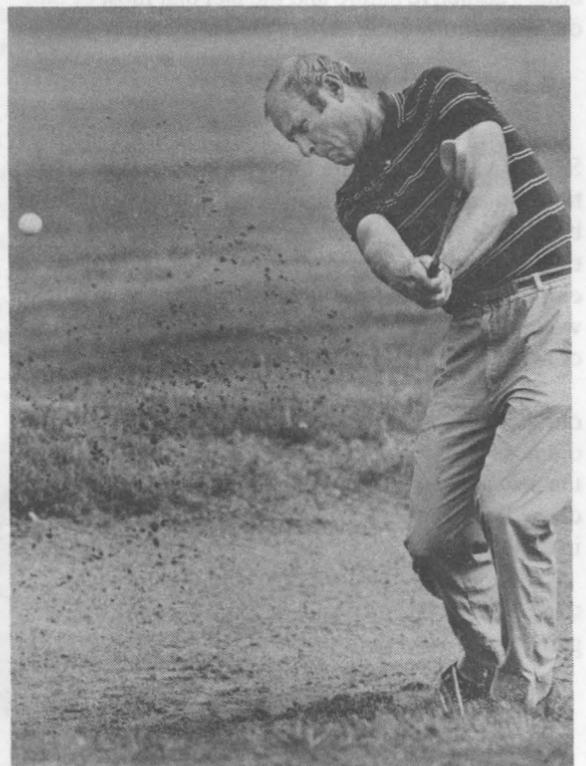
earphones and dragon cap on head. While the cars and buses often slow to a crawl, Lyle keeps striding along — a tribute to the accuracy of Henry David Thoreau's "Swiftest Traveler" observation above the headline.

"A fellow worker got me started ten years ago," says Lyle. He started slowly, riding the bus partway and then walking. "It was my main exercise at the time," he says.

It's five miles from Lyle's home to his office, but he now walks more than that. Three years ago, after his wife's death, he decided to get serious about walking for his health. "It's a painless way to lose weight and I didn't go on a special diet," says Lyle. He lost 50 pounds.

The first year he covered 1500 miles; the second and third years he stretched the distance out to 2400 miles. Besides walking to work, he hikes the Sandias. "I'll cut down on my walking time this year," he says. "I was losing too much weight."

It takes Lyle one hour and ten minutes to get to work. And, for those who are curious, the books he reads are mainly science fiction. ●JW



CHIPPING HIS WAY OUT OF A SAND TRAP, John Brane (2832) demonstrates the form and concentration that earned him the second ace of his golfing career. John scored a hole-in-one with a six-iron on the approximately 165-yard number 5 hole at the Ladera Golf Course on April 23.

Fun & Games

Golf — Sandia Golf Association winners at the Chet Fornero Memorial Golf Tournament (individual basis) at Cochiti Lake Golf Course on April 23 included: A Flight, Mark Calvin (3532); B Flight, Reynold Tamashiro (7412); C Flight, Dennis Gutierrez (7535); D Flight, Robert Martinez (7472); E Flight, Frank Arellano (6422); and F Flight, John Garcia (6423). Winners of the longest drive for each flight were: A Flight, Orlando Espinosa (7485); B Flight, Carleton Palmer (3551); C Flight, Mike Sjulín (7265); D Flight, Ken Ward (1823); E Flight, Angie Rivera (2831); and F Flight, George McClafflin (3437).

SGA first-place winners at the Rail Classic Golf Tournament (two-man team best-ball) at the Tierra

Del Sol Country Club in Belen on May 7 were: A Flight — Billy Duggin (1221) and Ed Jones (1242); B Flight — Tom Welch (9242) and George McClafflin (3437). There were four flights for the longest drive; winners were: A Flight, Mark Calvin (3532); B Flight, Joe Vigil (7846); C Flight, Mike Allen (6422); and D Flight, Jay Tidmore (3722).

* * *

More Golf — The USDOE/AL Federal Women's Program is sponsoring a golf tournament on July 9 at Cochiti Golf Course to benefit the AL Scholarship Fund. The \$35 entry fee covers donations, greens fees, cart rental, food, and drinks. The tournament is open to men and women. Entry fee deadline is June 22. Call Michele Mancuso (DOE/AL) on

6-4211 for more information.

* * *

Ski Patrolling — Sandia Ski Patrol leader Jack Cyrus (9122) reports that patrol members (many of them Sandians) helped 369 fallen skiers during the 1987-88 season. For most of the injured, that involved first aid and a ride down the slopes in a rescue toboggan. Most of the ski injuries were minor. "A few of our patrollers retired at season's end," Jack says. "We're looking for replacements. We need strong skiers, male or female, especially anyone who can ski patrol during the week." For additional information, interested skiers should call patroller Alton Donnell on 299-7123.

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

- SORRY** — no more Tech Area aerial pix. We do have Sandia T-shirts and caps (\$7 each). South Highway 14 Project, Bldg. 814, Rm. 1.
- BUTLER CHST/SECRETARY BUREAU**, circa 1840, mahogany veneer, cherry, tulip poplar, brass locks, glass knobs, dovetailing, \$1500. Richter, 265-2374.
- GARAGE SALE**, benefit for Albuquerque Chapter of NM Head Injury Foundation, June 4, 8 a.m.-5 p.m., parking lot at SE corner of Indian School Rd. and Moon. Saavedra, 877-9185.
- TWO REFRIGERATORS**: 18.6 cu. ft., \$350; 16 cu. ft., \$250; 2 electric lawn mowers, \$40/ea. Sisneros, 266-1852.
- TWO SONY SPEAKERS**, SS-U500, 10" woofer, new, still in box. Cumiford, 877-6498.
- JUMP SEATS** for '82 (or similar year) Datsun pickup, w/seat belts, \$30. Holmes, 292-0898.
- TRUNDLE BED FRAME & HEADBOARD**, \$30; beige & gold love seat, \$200; Bundy alto sax, \$200. West, 292-7091.
- LOVE SEAT/CHAIR**, oak telephone stand, oak dining-room chest, pie rack, area rugs, cast-iron stove, misc. accessories. Eaton, 294-4209.
- SEARS KENMORE ELECTRIC RANGE**, green, \$75; Sears Cold-spot refrigerator, self-defrost, green, \$85; sofa, burnt orange, \$125. Gonzales, 299-1145.
- WOOD STOVE**, Vermont Castings Resolute, new in box, w/warranty, \$800. Baumgardner, 243-0789.
- 150-GAL. AQUARIUM**, eye-level, cabinet, pumps, filters, underwater seascape. Marron, 345-4006.
- BELLY-DANCE COSTUMES**, records, veils, jewelry. Ginn, 883-0004.
- FOUR TRUCK TIRES**, 7.00x15, \$50. Wilcoxen, 296-8295.
- CARTOP RACK**, mounts and clamps to gutter rail, 34" x 54", \$12. Rainhart, 821-3690.
- CAMPER SHELL** for short-wide pickup, 75 pounds, \$250 OBO. Marquez, 836-5153.
- COMMODORE 64 COMPUTER**, color monitor, disk drive, LX-80 printer, Wico controllers, Koala pad, more

than 200 programs, \$500. Tarbell, 292-0141.

DOBERMAN, adult female, housebroken, spayed, black w/tan, AKC papers, recent shots, good w/kids, not good w/cats, free. Slezak, 296-0471.

ELECTRIC GUITAR, practice amp, steel-sash windows, Mustang dashboard, Triumph motorcycle parts, '74 Sportster covers, typewriter, fireplace screen. Gonzales, 344-4933.

WINDSURFER HULL, Vinta 365, 12', 210-litre, quad-concave, 6 foot-straps, aluminum mastrack, universal, no rig, \$375. Ritchey, 298-4311.

FULL-SIZE MATTRESS FRAME, w/4 casters (2 lock), \$25. Spilka, 888-9573.

'81 **SUZUKI 65650E HEADERS**, Sports Elites, \$800. Litts, 884-9010.

ATARI ST520 COLOR COMPUTER, w/1MB RAM, 2 floppies, software, all documentation, \$425. Laguna, 298-1732.

MAPLE BUNK BED SETS w/mattresses, \$150/ea. Jones, 299-9032.

QUEEN-SIZE MATTRESS and box spring, trade for full-size. Johnson, 299-1475.

BACH STRADIVARIUS TRUMPET, \$550. Christopher, 266-4383.

FOUR TIRES: P205/75R14, 95% tread left, \$80/4, \$50/2. Stuart, 299-9190.

FIFTY REDWOOD 2 x 6s, all at least 10' long, \$50. Reed, 884-8643.

STEEL DESK, \$60. McDonald, 275-3075.

SEARS ELECTRIC DRYER, \$100; Precision RF-sig. generator; Heath Kit tube tester. Conrad, 299-5316.

METAL TOOL SHED, 9'6" x 9'6" x 6'2" tall, wooden floor, you disassemble and haul, \$50. Pasterczyk, 255-2066 leave message.

LAWN MOWER, Toro electric, \$15. DeReu, 275-2336.

SEARS OXY-ACETYLENE WELDER, w/Argyle tanks, cost \$615, sell for \$415 OBO. Asprey, 296-6673.

COLEMAN CATALYTIC CAMPING HEATER, \$25; electric ice cream freezer, \$15; queen-size bedspread, yellow floral, \$15; Sony tape deck, needs work, make offer. Caskey, 296-6372.

FOUR CHEV. TRUCK RIMS, 8-lug, 16.5", will not fit Ford pickups, \$100. Orzel, 298-4251.

KENMORE WINDOW AC, new, 8-spd., 8000 Btu, steel cabinet; '69 Coachman overhead camper, 11-1/2', self-contained, sleeps 6, gas/electric refrigerator, thermostat heater, intercom, jacks. Lovato, 836-1696.

BUNDY CLARINET; camper shell for LWB pickup, 8', \$300. Sanchez, 292-3852.

TWO-WHEEL TRAILER, needs work, step bumper, transfer case for Scout II; shop manuals for '80 Skylark and '87 Nissan Maxima. Brooks, 299-1884.

PFAFF SEWING MACHINE, model 1229, \$350. Fox, 266-6606.

MEDICINE CHEST, 24" wide x 22" high, \$15; vanity w/sink, 19" wide x 29" high, \$20; vanity, 23" wide x 48" long x 30" high, \$45; bathroom window, 2' x 2', \$10. Benton, 877-2473.

'83 **NU-WA TANDEM TRAVEL TRAILER**, 19', original owner, fully self-contained, foam insulation, refrigerator, more. Goldenberg, 821-6209.

FENDER STRATOCASTER GUITAR, w/case, remolo bar, humbucker, 2 single-coil pickups, Washburn amp, \$400. Garcia, 822-1401.

GARAGE SALE: 30 years of misc. accumulation, June 3-4, 8 a.m.-5 p.m., 1310 Sasebo NE (Lomas east, cross over Tramway, take 4th left). Davies.

WIRE DRESS FORM, "My Double", w/stand, \$25; 4 tires, HR78-15, \$25. Spires, 275-3655.

GE ELECTRIC STOVE, 30", white, \$75. Markowitz, 294-0332.

CHILD'S BIKE SEAT, \$10; Weber barbecue grill, 18", \$10. Drotning, 294-4807.

TENT TRAILER, lightweight, \$400; camper shell for small truck, 6', \$200. Madsen, 294-3235.

ICE MAKER, 110 vac, \$50; white window shutters, four 3-panel sections, 35" W x 25" H, \$100. Walkington, 842-1938.

CANON AE1 CAMERA, 3 lenses (50mm, 28-90mm, 75-300mm), Vivitar 2500 flash, misc. accessories; Elton rechargeable shaver. Sherwood, 299-8146.

MAN'S TAN BLAZER, size 40S; beige fiberglass shower-wall panel system, fits 30" to 36" W x 20" to 36" D x 70" H. Flanigan, 299-0049.

TORO MOWER, electric start, self-propelled, \$275; 10" radial arm saw, w/stand, extra blades, \$275. Bowland, 256-1861.

ST. BERNARD PUPPIES, AKC-registered. Sargent, 298-7977.

TRAILER, 4' x 8' x 4', 2" hitch, heavy-duty springs, carries full cord of wood, \$280. Talbert, 298-9036.

KING-SIZED WATER BED, Big Sur, new, mirrored headboard, heater, \$275. Falacy, 293-2517.

LANDSCAPING ROCK, average size about 3", free; chair and swivel rocker lawn furniture set, \$30. Lane, 884-4566.

INFANT SWING, \$10; port-a-crib, \$25; bumper pad, \$5; 2 med.-size doghouses, \$15/ea. Beasley, 298-3398.

BEER MEISTER, holds full-size keg, w/CO₂ bottle and gauges. Golightly, 293-5987.

TRANSPORTATION

'83 **FORD RANGER**, 4-cyl., 4-spd., LB, AM/FM cassette, \$3200. Litts, 884-9010.

T-38 LIGHTNING RECUMBENT BICYCLE, red, 25 lbs., w/accessories. Corwin, 265-6588 or 298-0113.

'86 **TAURUS**, V-6, PS, AT, 15K miles, cruise, tilt, \$8800. Miller, 275-3942.

'63 **CORVAIR**, 4-dr., AT, restorable, needs body work and paint, original owner, \$450. Horine, 266-4534.

'74 **CORVETTE COUPE**, 350, loaded, silver & burgundy, recently restored, records available. Bukaty, 345-4691.

'84 **JEEP CJ-7**, white w/nutmeg hardtop and softtop, 5-spd., AM/FM cassette, loaded, \$7300. Snow, 883-1268.

'64 **RAMBLER AMBASSADOR**, one owner, 45K miles, garaged, original paint, new tires, \$2500 OBO. Furaus, 293-9799.

'86 **CAMARO SPORT COUPE**, silver, louvre, AM/FM stereo, AT, PS, PB, AC, OD, \$7400 OBO. Pineau, 821-1628.

'85 **OLDS CALAIS**, 2-dr., 4-spd., 4-cyl., cruise, AC, PS, PB, AM/FM cassette, 21K miles, \$5800. Benavides, 897-1317.

GIRL'S BICYCLE, Schwinn, 24", double-bar frame, Bendix coaster brake, kickstand, front basket, \$25. Daut, 255-2529.

'81 **BMW 320i**, 63K miles, AC, 5-spd., 2-dr., \$8000. Herrmann, 255-7327.

'81 **SUBARU DL**, 2-dr. hatchback, one owner, 5-spd., 65K miles, AM/FM cassette, metallic blue. Spilka, 888-9573.

'81 **FORD FAIRMONT SW**, 6-cyl., PS, PB, AC, AT, \$2250. Reese, 828-0113.

'66 **VW BEETLE**, original condition, never modified, \$1450. Coleman, 884-5009.

'67 **MGB/GT**, not running, \$1500. Koontz, 892-8437 leave message.

'81 **PONTIAC GRAN PRIX**, V-6, PS, PB, AC, AT, tilt, 53K miles, \$2950 OBO. Sisson, 296-3883 after 5.

'82 **FORD ESCORT**, 4-dr. hatchback, AC, AM/FM tape, \$2000. Miller, 873-3450.

'84 **VW VANAGON**, AC, AM/FM, 4-spd. Shephard, 298-4879.

'79 **HONDA CB650**, full fairing w/lowers, trunk, 9.3K miles, spare parts, \$1200. Greenslete, 268-8394.

'84 **HONDA CIVIC S**, \$4000. Draper, 281-2663 evenings.

'76 **CADILLAC SEVILLE**, light green, dark green vinyl top and leather interior, loaded, Michelin tires, 88K miles, \$4200. Brooks, 299-1884.

'70 **BARRACUDA**, 318, won 5 first-place trophies in various car shows, \$4000. Stephenson, 299-3914.

ARROWGLASS BOAT, 17'6", V-hull, 100-hp Mercury outboard, custom cover, canopy, trailer, \$2500. Shafer, 281-3036.

'83 **TOYOTA CELICA GT**, hatchback, PS, PB, AC, AM/FM cassette, cruise, 5-spd., 45K miles, \$5200. Tucker, 292-8954.

MAN'S 10-SPD. BIKE, \$20. Drotning, 294-4807.

'82 **SUZUKI GS850G**, fairing, saddle bags, luggage rack, crash bars, new tires, \$2500. Greving, 831-6015.

'83 **PORSCHE 944**, sunroof, taupe metallic, extended warranty. Chavez, 265-3886.

'57 **CORVETTE**, white/silver bullet w/red interior, 283, AT, removable hardtop, \$16,000. Cerutti, 292-1086.

'77 **KAWASAKI KZ-400**, 28K miles, \$250. Talbert, 298-9036.

'80 **SUZUKI GS450S**, 15K miles, extras, \$650. Lamppa, 299-1119.

'78 **MERCEDES 300D**, 5-cyl. diesel, AT, AC, sunroof, \$6900. Novotny, 296-7167.

'69 **BUICK SKYLARK CONVERTIBLE**, 350, AT, PS, \$1000. Reich, 821-5528.

BOY'S BMX BICYCLE, 20", coaster and hand brakes, \$40. Anderson, 292-9215.

GT PRO SERIES BMX BIKE, w/4130 cromoly frame, fork, handlebars, ridden 3 times, cost \$410, sell for \$275. Tang, 293-9331.

'68 **VW BAJA**, \$1600; '78 Honda 185, \$900 OBO. Sanchez, 255-5515.

REAL ESTATE

CORNER LOT, Glenwood Hills, views, \$69,500 or SE commercial trade. Richter, 265-2347.

3-BDR. HOME, 1 bath, new carpet, paint, and doors, 12' x 30' patio, E-Z storm windows, assumable 9% fixed. Campbell, 294-6000.

10 **UNIMPROVED ACRES** in Colorado near Navajo Lake, irrigation water, timber. Wheeler, 1-864-8868 (Belen).

4-BDR. TRI-LEVEL HOME, 2400 sq. ft., 2-3/4 baths, FR, DR, LR, in-law apt.,

9.5% VA assumable. Underhill, 294-5774 by appointment.

3-BDR. HOME, Bellehaven area, 1-3/4 baths, 10' x 20' finished and insulated workshop, 8% no qualifying, \$88,900. Zutavern, 298-6523.

'81 **WOODLAKE MOBILE HOME**, 14' x 55', Del Rey Park, will finance. Baker, 888-0410.

4-BDR. HOME, Sandia Heights, 2-1/2 baths, vaulted ceilings, city and mountain views, natural gas, solar, sprinkler system, built-ins. Gonzales, 898-4046.

4-BDR. HOME, 6604 Leander NE, 2140 sq. ft., 2-1/2 baths, new kitchen cabinets, landscaped, sprinklers, \$116,000 negotiable. Wayne, 821-3484.

ONE-ACRE VIEW LOT, 2 miles south of Edgewood, electricity and water, \$9900. Reed, 884-8643.

3-BDR. 2-STORY HOME, NE, 2-1/2 baths, 2-car garage, cathedral ceiling, skylights, FP, landscaped, sprinklers, 1 year old, near Spain & Juan Tabo, \$109,000. Chu, 275-9054.

2-BDR. MOSSMAN TOWNHOUSE, NE, 1600 sq. ft., FP, double garage, 2 full baths, walk-in closets. Bennett, 889-0929.

4-BDR. HOME, Kachina Hills, 2200 sq. ft., patio room, 2-1/2 baths, FR w/wood stove, cathedral ceilings, 1/3 acre, landscaping w/sprinklers, mountain/city views, cul-de-sac, assumable VA at 10%, \$139,900. Boye, 296-3350.

TWO RUIDOSO TIMESHARE WEEKS, weeks 20 and 41, \$1500/ea. Sargent, 298-7977.

2.5- AND 5-ACRE LOTS in Taos County, sage, juniper, pine, mountain views, Sec. 9, 28N, 10E, \$250/acre. Dalphin, 265-4029.

3-BDR. HOME, near Tramway & Lomas, 1-3/4 baths, great room w/wood stove, thermal windows, fruit trees, views, mid-\$70s. Andraka, 294-2618.

4-BDR. HOUSE, 1500 sq. ft., near San Mateo & McLeod, \$82,500. Peterson, 884-0483.

3-BDR. HOME, near Lomas & Louisiana NE, 1-3/4 baths, 2166 sq. ft., covered patio, 2-car garage, FP, separate DR. Kidd, 256-9795.

WANTED

EXERCISE BICYCLE, Schwinn Aerodyne. Vigil-Lopez, 242-7001.

HAULER, someone to haul off old (1930s-1940s) rusty car parts from property east of the mountains. McCornack, 296-3936.

LENS for Canon AE1, 28mm or 24mm. Snow, 883-1268.

YOUR FAVORITE SAYING OR GAG, Murphy's Law, etc., that you have above your desk or bench, will try desk-top publishing on them, free. Ginn, 883-0004.

TOW CAR: Toyota or Honda, '82-'85, low mileage, very good condition, with AC. Adams, 881-4351.

WORK WANTED

EVAPORATIVE COOLER PREPARATION, pad replacement, by college student. Coulter, 275-2183.

HOUSEPAINTING, exterior and interior, by college student, experienced. Dickey, 275-0890.

It's Basie-Boogie and Dipsy-Doodle Time, So Catch the Chattanooga Choo-Choo Next Friday

THANKS FOR THE BOOGIE RIDE is what you'll say next Friday night (June 10), after you've danced to the Big-Band tunes of Don Lesmen and crew from 8 to 11 p.m. Beforehand, choose one of the elegant entrees (prime rib or poached halibut) available at the two-for-one special dinner. And remember — there's a food discount when you bring along your membership card. Lesmen always packs the place, so reach for that telephone and call in your reservation ASAP (265-6791).

INVASION OF THE ISLETANS is what's happening tonight. That's right — those Poor Boys from south of town are back at the Club to dish out the shuffle music from 8:30 p.m. to 12:30 a.m. Sharpen your c/w skills ahead of time by taking in the free dance lessons (7:30-8:30). Chow choices at the two-for-one are filet mignon or scallops.

LIVE PIANO MUSIC in the main lounge every Friday night between 6 and 8 p.m. is another reason to stop by after work for a little R&R as you head into the weekend. Meet your friends and relax over a cold one. Why fight the rush-hour traffic?

Retirement Planning

Fred Lancaster of New York Life Insurance Co. presents another seminar on how to get the most out of your retirement years on June 8 in the Conquistador room. If you plan to attend the session (5:00-6:30 p.m.), give Fred a call at 883-5757.

FAMILY NIGHT FUN tomorrow night (June 4) includes a low-price buffet (and cartoons for dinner entertainment) starting at 5 p.m. Then hang on to your hats, because Angela "Murder, She Wrote" Lansbury lights up the big screen at 6 in the Disney movie, "Bedknobs and Broomsticks." Add up Lansbury's special touch, some ingenious animation, and award-winning special effects — and you have one heck of a show.

Fun & Games

Fitness — Get Fit New Mexico will again attempt to break the Guinness record for number of participants in a single aerobic event (record stands at 2200) as it closes its 10-week program with "Get Fit Day" on June 4 from 9 a.m. to 1 p.m. at UNM Johnson Center. Coordinators hope to attract more than 3000 participants in what might be the "World's Largest Aerobic Class." Other events include a fitness workshop by Slim Goodbody, star of the "All Fit" video series for children; demonstrations and workshops by national aerobic champions Jeff Vandiver and Scott Gale; fitness displays and special health tests. Admission is free. For more information, call HealthNet at 256-9861.

* * *

Golf — Sandia Women's Golf Association (SWGGA) went to Socorro for an 18-hole tournament on May 14. Winners were: Flight A — Low Net, Debbie Tricoglou (7485); Low Putts, Mary Gonzales (6331). Flight B — Low Net, Marijo Hinrichs (3544); Low Putts, Phyl White (5122). Flight C — Low Net, Betty Turk (4010); Low Putts, Betty Worley (4000).

SPECK winners included Ree Gerchow (122), Shirley Kendall (dep.), Teresa Mills (3723), Ginny Moore (3545), Nellie Gerchow (dep.), and Janice Montoya (152).

Upcoming 18-hole tournaments are scheduled for Los Altos on June 4 and UNM South on June 18. For SWGA membership information, contact Marijo Hinrichs on 6-0464.

THEY'RE DOING SWIMMINGLY, thank you — "they" being Coronado Aquatic Club (CAC) members. Tomorrow morning (8:30-11:00 a.m.), come out for a parent-orientation session and a pre-season practice for members. If you'd like to join CAC, but haven't done so yet, you can register tomorrow and get in on the fun. (Members must be 18 years old or younger and able to swim the length of the pool unaided.) CAC season starts next week with a meet at Mountainside YMCA on June 8 (3:30 p.m.); first home meet — against Tanoan — is June 11 (7 a.m.). More info from Pat Pucket (298-6067) or George Novotny (296-7167).

OUR FAVORITE CARD PLAYERS, the T-Bird Sharks are back at the tables on June 16 and June 30; both sessions begin at 10 a.m. These unretiring retirees really know how to have a tip-top time, so plan to join them for gaming, good conversation, and gastral delights (all free, of course). P.S. to T-Bird Roadrunners: June rally's at Fun Valley aka Cliff Cove, Colo. Contact wagon masters Duane Laymon (822-1749), Tom Brooks (344-5855), or Joe Shelby (292-4605) for the scoop.

ALL C-CLUBBERS and their guests are invited to a special T-Bird program, "Hospice — Hospital Home Care." Hospice, a joint program of Pres and St. Joe's Hospitals, comforts and cares for terminally ill patients and their families. Lunch in the line, then meet at the south end of the ballroom on June 13 at 1 p.m.

WESTERN NIGHT on Thursday, June 9, brings back Trio Grande with its one-of-a-kind stomp music from 7 to 10 p.m., following free c/w dance lessons from 6 to 7. Free munchies and special drink prices all evening.

A SUNNY SUNDAY (rain or shine) is in store for you if you join the brunch bunch on June 12 anytime between 10 a.m. and 2 p.m. This one's really special, because you can see two fashion shows while

you munch on items from the marvelous menu. The first, at 12 noon in the ballroom, features summer casual wear; the second, at poolside (2 p.m.), features swimwear and "wash-and-wear" hairdos. Don't forget to make reservations.

SOMETHING NEW UNDER THE SUN (and moon) is Bingo Night, scheduled twice this month (June 16 and 30), starting at 6:45 p.m. each evening. There'll be 19 games during these "fun nights" for the entire family, and generous cash prizes for winners of each game — along with some very special door prizes. Card sales start at 5:30 p.m.; a single package (15 games) goes for \$5. Don't bother cooking; soup and sandwiches are available at reasonable prices. And bring a friend — there's no extra charge for guests at these first two sessions.

UNFORGETTABLE is the only way to describe those terrific trips sponsored by the C-Club. Here are a couple of offerings:

Colorful Colorado (July 14-17) — This one's chock-full of places to go and things to see in our neighbor to the north: Mesa Verde National Park and Durango (and a ride on the Durango/Silverton narrow-gauge train). You'll also visit some interesting sites in northern N. Mex.: Chaco Canyon and Chama. Prices range from \$334 (2 persons, 1 bed) to \$408 (single). Included are RT charter bus fare, a BBQ chuck-wagon dinner at Mesa Verde, a melodrama and dinner at Angel Park near Aztec, and some meals and lodging at the Purgatory Village Center (just outside Durango). Reserve space by calling Ann Mitchell, Zia Travel Services, on 266-1787.

Canadian Capers (Aug. 27-Sept. 4) — Banff, Jasper, Lake Louise, the Columbia Ice Fields; you get the idea, so sign up now for this photographer's dream trip. The \$876 tab/person (double) covers RT air fare to Calgary, motor coach ground transportation, eight nights' lodging, several meals, and more. A \$300 deposit holds your space; final payment's not due until July 27.

Congratulations

To Betty and Steve (2116) Babicz, a son, Phillip Jereb, April 27.

To Regina (3153) and Manuel Valenzuela, a daughter, Christina, May 8.

To Anne and Mark (5245) Snell, a daughter, Margaret Anne, May 12.

Just What We've Been Waiting for . . .

Off-The-Wall alarm clocks, shaped like sports balls, can be turned off by throwing them against the wall.

Wall Street Journal

Welcome

Albuquerque

Peter Davies (6331)

California

Steven Schafer (7253)

Illinois

Ronald Ralson (2346)

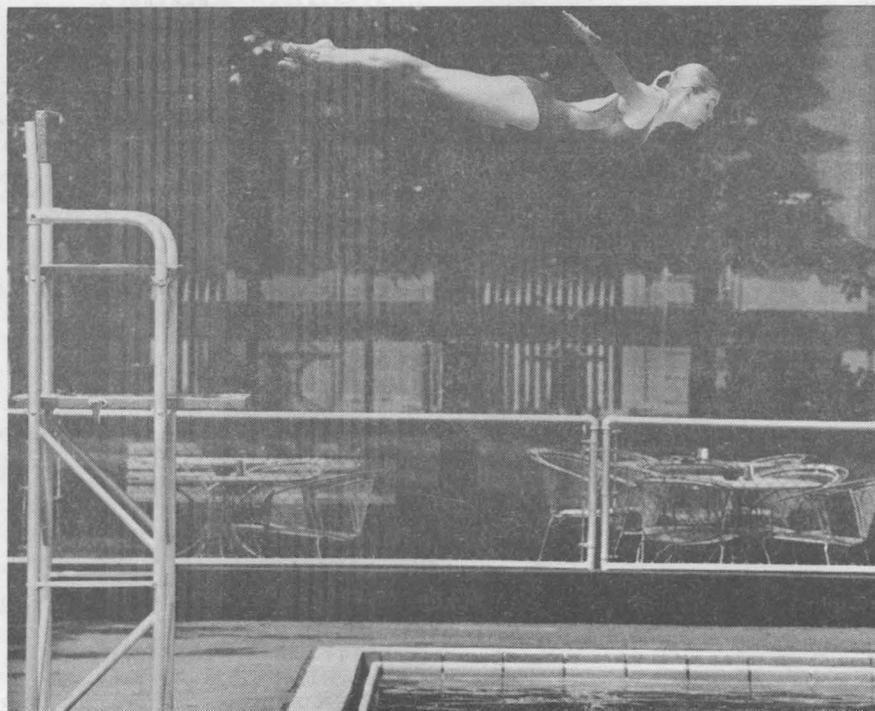
Nebraska

Jay Kratochvil (5268)

New Mexico

Margaret Hug (2312)

Lee Kauffman (3312)



SHE FLOATS THROUGH THE AIR — and with the greatest of ease. Kathleen Chabai, C-Club lifeguard and diving instructor, suggests a great way to beat the heat: Head for a cool pool. Kathleen is the daughter of Al (DMTS, 7112).

Vacuum Ultraviolet Light Source Developed

Two months ago, a report by a national committee of laser researchers called for development of new pulsed sources of coherent radiation in the ultraviolet and "vacuum" ultraviolet part of the electromagnetic spectrum.

The study lamented "glaring gaps" in available, tunable sources in the very short wavelength range from 100 to 400 nanometres (nm), or billionths of a metre. It pointed to the need for such sources for laser chemistry, materials processing, medicine, and fundamental areas such as spectroscopy.

The timing is just coincidence, but Arlee Smith of Advanced Laser & Optoelectronic Div. 1124 and Joe Alford of Laser and Plasma-Processing Div. 1128 have just announced a new tunable light source that exactly fills one of those key "gaps."

The new laser-like device generates tunable, highly efficient, coherent ultraviolet radiation at a wavelength of 130 nm. It is tunable from 120 to 140 nm. Perhaps most important, it's nearly a thousand-fold more efficient than previous light sources operating in this part of the spectrum.

And the device has generated a world record amount of energy at this wavelength — 1.1 millijoules. Since a joule is the amount of energy in 1 watt acting for 1 second, 0.001 joule may not sound like much, but this energy is delivered in nanosecond pulses at megawatt bursts of power. For some laboratory applications, only 1 microjoule is considered a hefty dose. Since the device uses parallel beams, it is area-scalable to far more energetic levels.

The achievement, which took several years of research by Arlee and Joe, draws on theoretical models by Ron Hadley (1124). The laser itself was demonstrated jointly by Sandia and Spectra Technologies, Inc., whose research group built the laser, under a Sandia contract, at its Bellevue (Wash.) laboratory.

"There are probably very wide applications for these types of sources," says Jim Gerardo, manager of Laser and Chemical Physics Research Department 1120. "It's very timely work."

"Vacuum" Ultraviolet Explained

Ultraviolet radiation with a wavelength of less than 200 nm is called vacuum ultraviolet (VUV) because it is absorbed by air and other gases. It therefore must generally be transmitted in a vacuum, that is, an evacuated apparatus. It is sometimes called extreme ultraviolet radiation.

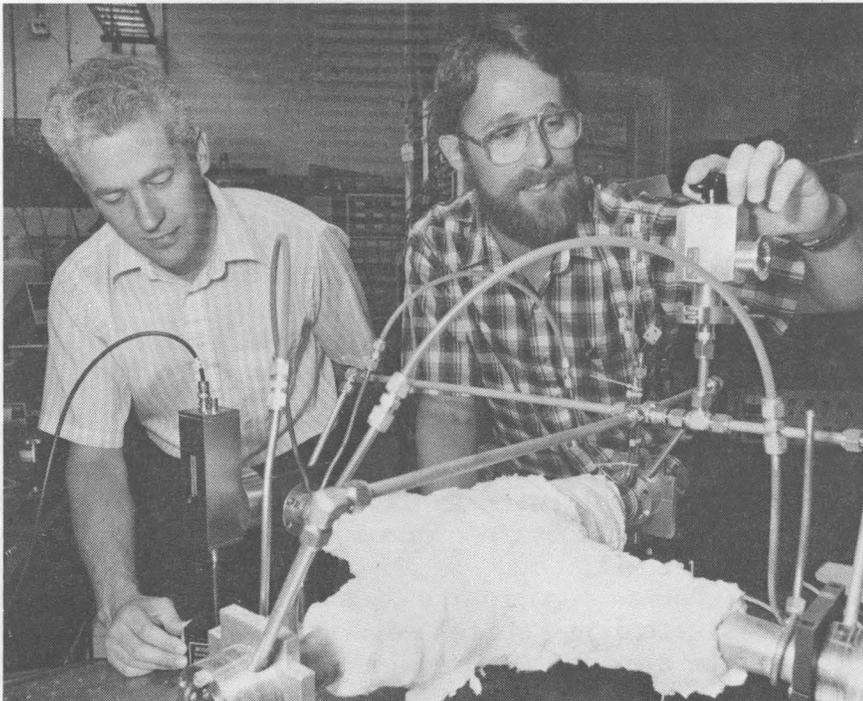
("Wavelength" refers to the distance between one peak or crest of a wave of light, heat, or other measure of electromagnetic energy. Laser light obtains its special properties because it consists of only one wavelength, and its electromagnetic waves are all in step with each other, reinforcing each other.)

The new source may be useful in SDI applications because its 130-nm wavelength is an oxygen resonance wavelength. That is, a light source of 1-joule energy operating at this wavelength would excite oxygen atoms in the atmosphere. This could be used to produce ionization channels of interest to the SDI program.

But tunable, bright laser-like sources capable of operating in this area of the spectrum might also be useful in laser spectroscopy — to study basic chemical processes. Or in photolithography — to make microelectronic circuits of submicron line widths (see "Photolithography" story). Or as a diagnostic tool — to detect oxygen impurities in the plasma inside tokamak fusion machines. (Those intrigued by such possibilities should call Arlee.)

From 0.01 to 6 Percent Efficiency

Arlee and Joe were able to maximize the conversion efficiency of an energy-scalable VUV source by using a technique called sum-frequency mixing. In this method, light from three lasers that emit different frequencies of visible and ultraviolet radiation is combined. The mixed light is then passed through mercury gas to create VUV radiation of the desired frequency. The output frequency is the sum of the three input frequencies.



Using this method, Arlee and his group, working with Spectra Technology scientists, have achieved efficiencies of 6 percent, in contrast to the 0.01 percent typical of earlier methods.

The mixing process involves no "population inversion" of atoms and no stimulated emission, so the result is not literally a laser. (The word "laser," after all, is an acronym for Light Amplification by

Stimulated Emission of Radiation.) But it acts like one. Says Arlee, "the light has the same coherence and tunability as the pump lasers."

The nearly 1 millijoule energy achieved so far is released in short pulses of about one nanosecond, resulting in powers of about 1 megawatt.

Development of the new VUV source was made
(Continued on Page Four)



LAB NEWS

VOL. 40, NO. 12

SANDIA NATIONAL LABORATORIES

JUNE 17, 1988

Operations Began in February

Waste Management Facility Reflects Labs' Concern for Protecting Environment

A new hazardous waste management facility that's used for packaging and storing the tons of chemical wastes generated each year by SNLA organizations began operating last February at a site south of Area I.

The two-building facility "reflects Sandia's ongoing concern for protecting the environment," says Gordon Smith, supervisor of Environmental Programs Div. 3314.

"An R&D lab such as Sandia generates a variety of chemical wastes," Gordon continues. "It's important to segregate them according to chemical class and to package them properly. Ultimately, we ship them to a disposal or recycling facility authorized by the EPA [Environmental Protection Agency]. Until that occurs, it's our responsibility to handle and store them safely according to EPA regulations." (However, according to Gordon, Sandia continues to maintain some potential liability for environmental damage that occurs if the waste is improperly treated or disposed of.)

"The new facility provides an efficient setup for waste handling, as well as a storage area that's protected from the weather," says Gordon.

(Before the facility began operating, chemical wastes were sealed in 55-gallon drums, then stored on pallets at a deactivated landfill site in the southeast corner of Area III for later pickup by licensed contractors.)

One building at the new facility contains a number of bays, into which chemical wastes are sorted according to their "compatibility." Then the wastes



CHEMICAL WASTES, separated in bays by category, are placed on grates over open concrete sumps. Therefore, if a container leaks, the spillage is contained within the facility.

are repackaged in drums that are stored in the second building until they're shipped to a disposal facility.

Safety Features

"Safety was a primary concern when we designed the facility," says Gordon. "For instance, both buildings have overhead sprinkler systems that would activate in case of a fire. And the waste — separated in bays by category — is placed on grates over open concrete sumps. If there's a container leak, the spillage would be contained within the facility, rather than sinking into the ground."

(Continued on Page Four)

Antojitos

Blood, Toil, Tears, and Lots of Sweat — Sandia Livermore, along with much of the rest of the Bay Area, gets its water from the Hetch-Hetchy reservoir near Yosemite. And, like other subscribers to that water system, SNLL has been asked to reduce its water consumption by 25 percent. That means, among other things, "raising building temperatures to reduce cooling load." By extrapolation, then, Livermore Sandians are going to be 25 percent warmer this summer than last.

Let's see, 25 percent of 70° F is 17.5, so it'll be 87.5° — pretty bad. Let's do it in Celsius: Ah, 26° — much better. (Aren't statistics wonderful?) Whichever, I predict a decrease in neckties and an increase in fans, antiperspirant, and visits to the Computer Center.

* * *

Aren't Statistics Wonderful, Continued — "The Mississippi between Cairo [Ill.] and New Orleans was 1215 miles long 176 years ago. It was 1180 after the cut-off of 1722. Its length is 973 miles at present.

"Now, if I wanted to be one of those ponderous scientific people, and 'let on' to prove . . . what will occur in the far future by what has occurred in late years, what an opportunity is here! In the space of 176 years, the lower Mississippi has shortened itself 242 miles. That is an average of a trifle over one mile and a third per year. Therefore, any calm person . . . can see that 742 years from now the lower Mississippi will be only a mile and three-quarters long, and Cairo and New Orleans will have joined their streets together, and be plodding comfortably along under a single mayor and a mutual board of aldermen.

"There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact."

—Mark Twain, *Life on the Mississippi*

* * *

Green Side Up! — It's the time of year again when the cardboard sun screens blossom in the windshields of parked (I hope) cars. And a few of our folk, like the sod-laying Aggies who had to be reminded of the recipe, persist in getting the wrong side out. John Williams (3734) suggests using the screens as a pass/fail intelligence test for prospective employees. I'd go further: When you see an EMERGENCY - CALL POLICE plea in the windshield of a car in a RESERVED parking slot, I suggest that you note the Base sticker number and call our police (that is, Security) so the well-being of the DM, Director, or VP can be professionally ascertained. At Sandia, we care!

* * *

Jet Loses Power, Lands at WWII Airstrip — A Taca International Airliner making an approach in nasty weather Tuesday lost power in both engines and made an emergency landing at an abandoned World War II airstrip six miles short of the [New Orleans] runway, authorities said.

Asks Bob Manhart (3151), "Do you know what it means, to miss New Orleans?"

* * *

More on SAND Report Sentences — Anne Poore's (3151) favorite comes from a caption for a figure summarizing annual energy flows as calculated by a computer program (which shall remain nameless here). The final sentence in the caption: "Not all the Significant Digits are Significant." ●BH

* * *

De gota a gota se agota la mar. (Drop by drop the ocean could dry up.)

Events Calendar

June 17-18 — "Painting Churches," drama about an artist's struggling relationship with her aging parents; 8 p.m., Second Story Arts Center, Albuquerque Little Theatre, 242-4750.

June 17-19 — "Sweet Charity," by Neil Simon, Albuquerque Civic Light Opera Association presentation of story about ill-fated dance-hall hostess looking for love in all the wrong places; 8:15 p.m. Fri. & Sat., 2:15 p.m. Sun.; Popejoy Hall, 345-6577 or 277-2131.

June 17-19 — "A Girl's Guide to Chaos," adult comedy by Cynthia Heimel about four women whose social situations are far from their expectations; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

June 17-July 17 — "Mexico Nueve: A Suite of Lithographs," exhibit of 18 lithographs pulled at Tamarind Institute, featuring original prints by contemporary Mexican artists; regular museum hours, Van Deren Coker Gallery, UNM Art Museum, 277-4001.

June 17-July 22 — Annual Summer Raymond Jonson Exhibition, selected works from the Jonson Reserve and Estate collections featuring abstract landscapes; regular museum hours, Jonson Gallery (UNM), 277-4001.

June 17-July 24 — "New Traditions: Thirteen Hispanic Photographers," exhibit of works by New York-based photographers from Chile, Cuba, Colombia, Venezuela, Spain, Brazil, and North America; regular museum hours, upper gallery, UNM Art Museum, 277-4001.

June 17-Aug. 31 — "Dinosaurs in Action," new exhibit of four mechanical dinosaurs: adult and juvenile triceratops, brontosaurus, and tyrannosaurus; 10 a.m.-5 p.m., New Mexico Museum of Natural History, 841-1374.

June 17-18 — Soweto, South Africa, commemoration: featuring films ("Six Days in Soweto" and "Bound to Strike Back"), music, art, and poetry; 7:30 p.m., South Broadway Cultural Center, free, 848-1320.

June 17-July 4 — Third Annual Art Windows on Route 66: juried exhibition of storefront art installations in the Nob Hill District (Girard to Washington on Central Ave.); free, 251-2047.

June 18 — Summerfest '88: Juneteenth and Caribbean Night, food and entertainment; 5-10 p.m., Civic Plaza, 768-3490.

June 18 — 10th Annual Watermelon Evening: silent auction, children's games, food, and entertainment by magician Richard Searle, guitarist Bonnie Bluhm, and the Watermelon Mountain Jug Band; 4-10 p.m., First Unitarian Church (3701 Carlisle NE), free, 884-2999.

June 19 — Father's Day Concert, benefit sponsored by the Friends of the Corrales Library, musical variety by various performers, refreshments; noon to 7 p.m., Corrales Village Park, 898-3798.

June 19 — Arts in the Parks: Father's Day festivities — music, magicians, and dancers; 1:30-4:30 p.m., Hyder Park (Richmond & Pershing SE), free, 764-1525.

June 24 — San Juan Feast Day: Buffalo and Comanche Dances at San Juan Pueblo, Corn Dance at Taos Pueblo; call for times, 843-7270.

June 24 — "Musica y Danza Folklorica del Norte," music and dance from northern New Mexico communities; 7:30 p.m., KiMo Theatre, 848-1374.

June 24-26 — New Mexico Arts and Crafts Fair, featuring calligraphy, ceramics, jewelry, leather work, macrame, drawings, paintings, sculpture, stitchery, weaving, and woodworking displays; entertainment and demonstrations; 10 a.m.-10 p.m. Fri. & Sat., 10 a.m.-6 p.m. Sun.; NM State Fairgrounds, 884-9043 Mon. or Thurs. mornings.

June 29 — San Pedro Feast Day: Corn Dances at San Felipe, Santa Ana, and Santo Domingo Pueblos; call for times, 843-7270.

July 1-24 — "Born Yesterday," classic play by Garson Kanin about a young woman's rebellion against a domineering man and his political corruption; 8 p.m. Fri. & Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

Congratulations

To Debi and Steve (5262) Scott, a daughter, Caitlin Jennifer, April 7.

To Mary and Nate (1511) Bixler, a son, Daniel James, May 19.

To Sherrye (2500) and John (5214) Lavasek, a daughter, Lori Ann, May 20.

To Bernadette and Tom (7265) Brown, a son, Travis Garrett, May 26.

To Cecelia Zuni and John Lujan (7813), married in Isleta Pueblo, May 28.

To Alice (2635) and James Starcher, a son, Maxwell Charles William, May 31.

To Barbara and Dan (7521) Wahl, twin daughters, Chelsea Marie and Courtney Elyse, May 31.

To Lee Ann (122) and Tom Powell, a daughter, Heather Marie, June 4.

To Betty Boynton and Ken Campbell (7541), married in Las Vegas, Nev., June 4.

The Right Choice?



The Nebraska State Penitentiary solicits free books from Kimberly Press, whose only volume, *Conquering the Corporate Career*, opens with a chapter titled "Break Out of Your Cell."

Selwyn Feinstein, *Wall Street Journal*

LAB NEWS

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