

## Sandia Named Nat'l Laboratory

On Dec. 29, President Carter signed into law the FY80 Weapons Authorization Bill which had earlier been passed by both houses of the Congress. Language in that bill addresses itself to the three nuclear weapons laboratories and designates each of them, Sandia included, as a National Laboratory.

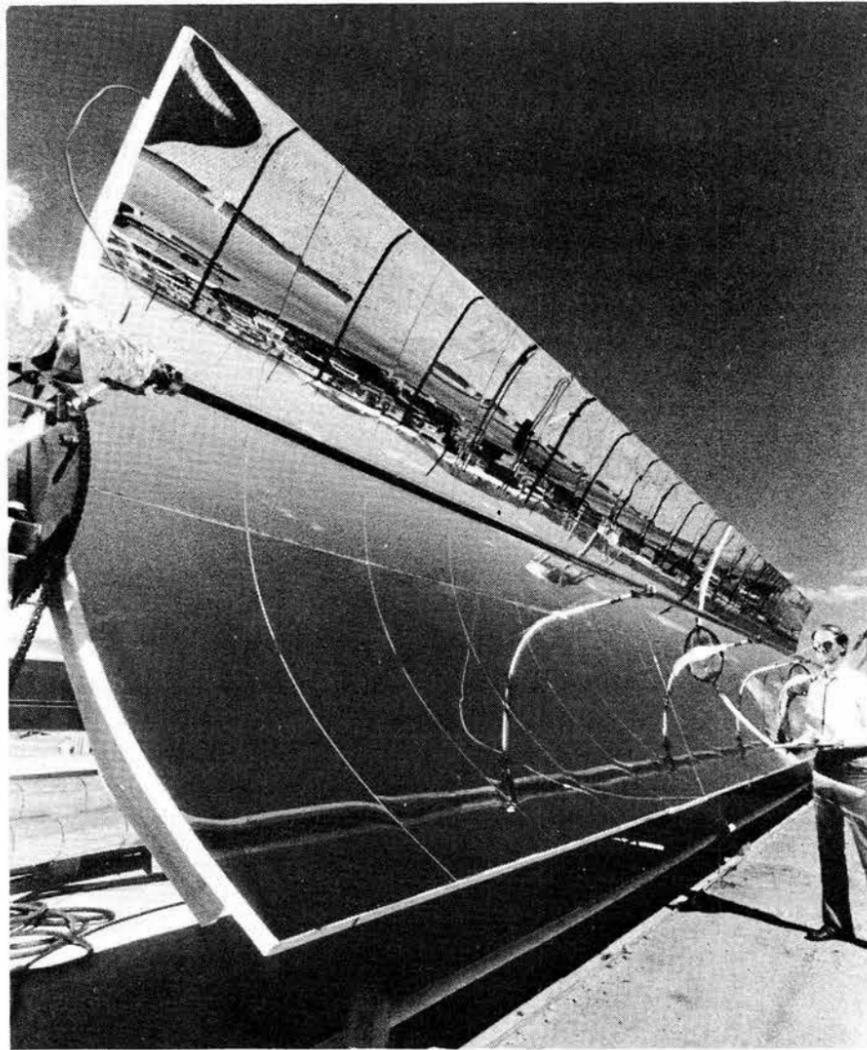
For Sandia, the specific designation is "Sandia National Laboratories." LLL becomes the "Ernest Orlando Lawrence Livermore National Laboratory," and LASL the "Los Alamos National Scientific Laboratory."

Basis of the change is found in this passage from the bill entitled "Management of National Weapons Laboratories":

"Sec. 212. (a) It is the sense of Congress that... the nuclear weapons laboratories... are unique national assets which must retain their primary defense focus and strive to sustain this Nation's world pre-eminence in the area of nuclear systems technology."

Four other DOE laboratories already carry the "national" designation. They are the Argonne National Laboratory, Brookhaven National Laboratory, Oak Ridge National Laboratory and the Idaho National Engineering Laboratory.

For the present, the impact of the changeover in places where the Labs' name appears is being examined.



**IMPROVED EFFICIENCY** — Sam Martin (2323), project engineer, stands beside the Engineering Prototype Trough, a new solar collector that has shown a solar-to-thermal conversion efficiency of 60 percent, some 10 to 20 percent higher than earlier collectors. The prototype is designed to be readily mass produced. See article on Page Four.

# LAB NEWS

VOL. 32, NO. 2

JANUARY 25, 1980

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

## Nurse Practitioners Are Part of the Medical Team

In medical circles, the nurse practitioner is often cited as the newest addition in the delivery of health care. A nurse practitioner is a registered nurse with advanced training who, in certain situations, provides health care previously supplied by a physician.

Sandia's medical staff has two NPs—Nancy Jeffery and Gwen Gorman (both

3332)—and, if you've visited Medical recently, you've probably met one of them. Nancy and Gwen are performing many of the physical exams given to employees and employee candidates, as well as seeing patients in the daily sick-call routine.

Nancy has been with the Labs for six years and has just recently earned her certificate as an NP. She completed her

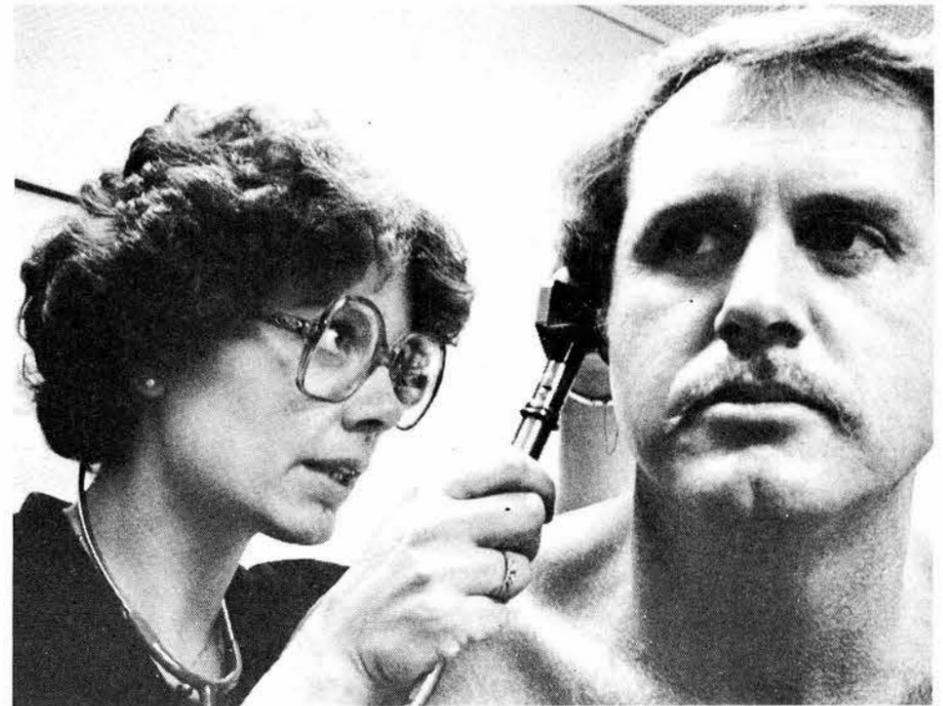
advanced training in Kansas in a Nurse Clinician Practitioner Program for RNs.

Besides this type of certificate program, an NP may also be trained in a master's level program that combines classroom learning with an internship supervised by a physician.

Gwen took the latter training in a  
[Continued on Page Nine]



NP GWEN GORMAN shows a happy James Kwak (5152) that his fractured finger is mending.



NURSE PRACTITIONER Nancy Jeffery performs an ear examination for Gene Lisotto (4342) during his routine physical.

# Supervisory Appointments

**MILT CLAUSER** to supervisor of Advanced Reactor Safety Analysis Division 4424, effective Jan. 1. Milt joined the Labs' solid state research group as a staff member in July 1967. Since then he has worked with a laser development division, the plasma theory organization and, most recently, with the Target Interaction Theory Division 4247.

Milt earned an SB from MIT in EE and his PhD in solid state physics from Cal Tech, followed by one year of post doctoral work in Munich, West Germany. He is a member of the American Physical Society. Most of Milt's leisure activities are concerned with his home and acreage in Corrales and some cross country skiing. Milt and his wife Patty have two children.

\* \* \*

**KENN PURTEE** to supervisor of Computer Administrative Support Division 2633, effective Jan. 16. On-roll since July of last year, Kenn has handled the administrative support and budgeting work for the plant engineering directorate. His new responsibilities entail providing administrative services for the computing directorate and reviewing requests for new computers; he will also prepare justifications and perform long-range planning and budgeting for new computers.

Before joining Sandia, Kenn had worked for 25 years for DOE in weapons programs with assignments in Washington D.C., Kansas City and Albuquerque. Kenn earned a BS in business from Rockhurst College (Mo.) and an MBA from the University of Missouri.

A do-it-yourselfer, Kenn enjoys working on his home and two acres in Bosque Farms. He and his wife Patricia have three sons.

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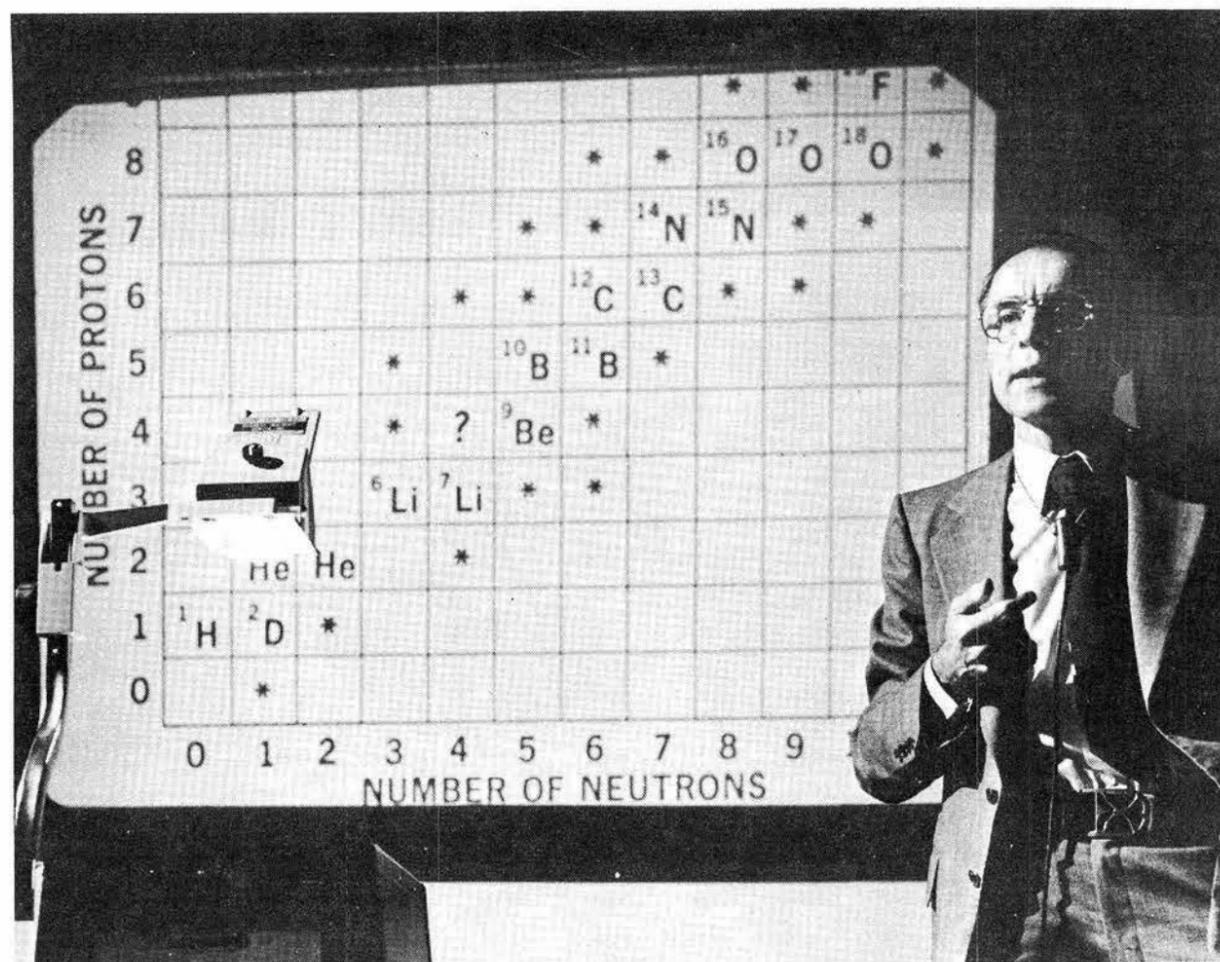
**DANA POWERS** to supervisor of Reactor Containment Safety Studies Division 4422, effective Jan. 1.



NEW SUPERVISORS—Kenn Purtee (2633), Milt Clauser (4424) and Dana Powers (4422), seated.

Joining Sandia in July 1974 as an MTS in the chemical metallurgy organization, Dana has been chiefly concerned with studies of high temperature reactions and reactor safety.

Dana attended Cal Tech where he earned his BS and PhD in chemical engineering. He is a member of the American Chemical Society. He and his wife Shirley live in the NE heights.



NOBEL LAUREATE Arno Penzias was the speaker at a Sandia Colloquium earlier this month. The Bell Labs physicist shared the 1978 Nobel honors with Robert Wilson, also of Bell Labs, for their discovery of the 3K cosmic background radiation which had earlier been predicted as part of the "Big Bang" theory of creation of the universe.

## LAB NEWS

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Editorial offices in Albuquerque, N.M.

Area 505 264-1053  
FTS 475-1053

ZIP 87185

In Livermore Area 415 422-2447  
FTS 532-2447

john shunny is editor

&

don graham ass't. editor

chuck cockelreas & norma taylor write

bill laskar does picture work

aided by gerse martinez

barry schrader & lorena schneider report livermore.

## Wright Brothers Fly Again

But this time it's Carl Wright (8201). An avid hang glider pilot the past four years, Carl flies a Bennett Phoenix C6, a flexible-wing glider commonly called a Rogallo after its inventor. The craft has a 32-foot wing span and weighs about 55 pounds. Carl's favorite gliding areas, with flights covering up to 15 miles, are Mount Diablo, Fremont Mission Ridge, and Glacier Point in Yosemite. Dangerous? "No more so than many action sports, and less than some—certainly a better record than sky diving," he says. Other Sandians who also enjoy hang gliding are Bob Green (8353) and Gary Clark (8354).



Carl adjusts flying gear—helmet, harness which attaches to the glider, and reserve parachute.

## Take Note

Congratulations are in order for SLL retiree Bill Jamieson, recipient of the 1979 City of Pleasanton "Mayor's Award" presented annually to the person making the greatest contribution to the civic betterment of the city. Bill has been active in the Pleasanton community for over 12 years. He chaired the Committee Against Garbage Environment (CAGE) for several years, is a member and former chairman of the Pleasanton Planning Commission, and serves on the Alameda County Fair Board of Directors.

## Sympathy

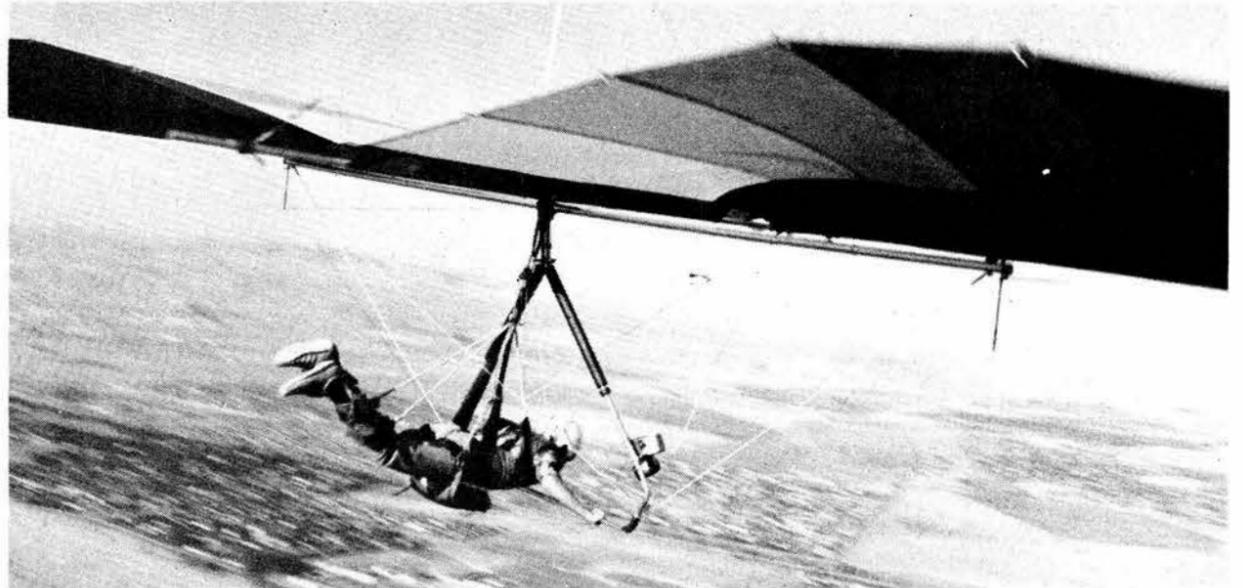
To Ollie Olivotti (8412) on the death of his son-in-law in Sacramento, Jan. 6.

To Henry Sorensen (8463) on the death of his mother in Tracy, Dec. 30.

To Gina Lamons (8463) on the death of her father in Oakland, Jan. 4.



Take-off run.



Just airborne and in flight over Pleasanton Ridge toward the Livermore Valley.

# LIVERMORE NEWS

VOL. 32, NO. 2

LIVERMORE LABORATORIES

JANUARY 25, 1980



Trudy (8161) and Bob Martin (8413)

## Retiring



Iona Ratcliff (8273)



Elwood Ingledue (8168)



Midge Walker (8423)

## Sandia Retiree & Wife Join Peace Corps

Many retirees regard travel as one of the pleasures of retirement. Gabby Gabaldon and his wife Pauline have coupled travel with volunteer service by becoming members of the Peace Corps. "We'll not only have the fun and excitement of travel," Gabby says, "but by sharing our skills with those who need them, we can learn about other people and other cultures."

Gabby retired in March 1978, but volunteer work has been an important part of his life. Following the disastrous earthquake in Guatemala in 1976, Gabby and Pauline spent two months in that country helping in the recovery operation (LAB NEWS, Aug. 20, 1976). And they have done local volunteer work since Gabby's retirement.

Their Peace Corps assignment is to the island of Jamaica, assisting in that government's efforts in rural development and education. Gabby will conduct workshops with the people, teaching them about the operation and maintenance of heavy equipment and farm machinery. Pauline will be working with the women in rural communities in the areas of home economics and child care. "Our main objective," Gabby says, "is to help them become self-supporting."

The Gabaldons left Albuquerque on Jan. 10 for their new home in Kingston, where they will live with a family for a few months. Kingston is headquarters, but they will have field assignments throughout

the Caribbean area.

Before their departure, Gabby told us that they plan to stay in Jamaica two to three years. They would be happy to see other Sandians passing through and can be contacted through the Peace Corps Office in Kingston.



PEACE CORPS VOLUNTEERS Gabby and Pauline Gabaldon.

## New Solar Collector Gives More For Less

A prototype of a solar collector that exhibits a significant improvement in converting solar to thermal energy has recently been demonstrated at the Labs. It was developed in Solar Energy Projects Department 4720.

Called the Engineering Prototype Trough, the collector converts 60 percent of the solar energy striking the collector to 600°F thermal energy in an oil-type heat-transfer fluid. Under equivalent conditions, first-generation concentrating collectors typically have demonstrated 40 to 50 percent efficiencies.

The prototype collector represents one step in the DOE program to improve performance and durability of line-focus solar concentrating collectors prior to mass production, where such collectors are under consideration for the generation of electricity and heat for industrial processes.

Line-focus collectors have a linear, often trough-like, reflecting surface that concentrates sunlight on a small, specially-coated receiver tube placed at the focus. A fluid, typically an oil, is circulated through the receiver and heated by the concentrated sunlight.

To achieve the improved performance, the Engineering Prototype Trough embodies several design improvements in the structure, reflector material, tracker and receiver coating.

The structure consists of an aluminum honeycomb core sandwiched between steel sheets formed into a 6½-foot by 20-foot trough. The mirror surface is a silvered, chemically-strengthened glass, manufactured flat but sufficiently flexible to be bowed for bonding to the trough.

Tracking is performed using a micro-processor that receives data from a solar radiation sensing wire wrapped helically around the one-inch diameter receiver tube. An improved black chrome coating, the result of a materials development effort at Sandia working with the plating industry, is electro-deposited on the receiver tube.

Overall objectives of the project are to demonstrate prototype collectors with high performance, durability and reliability that can be mass produced and thereby be made inexpensively. Engineering development is being conducted with industry so that collector designs reflect manufacturing expertise; the shared development will also stimulate commercialization of collector components.

Sig Thunborg (4722) is project leader for the collector development, and Sam Martin (2323) is project engineer for the Engineering Prototype Trough.

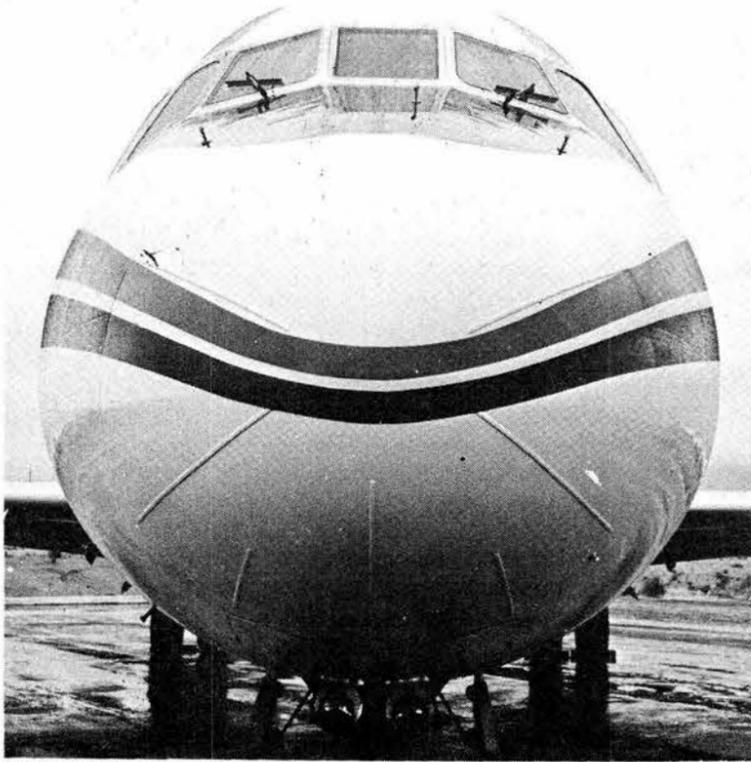


WHEN KEITH CULVER (1715) slumped over his desk in December in the early stages of a heart attack, he had one thing going for him—the presence nearby of these four men (seated) who had undergone the CPR training offered by Sandia Medical. The four immediately began CPR and, thanks to their ministrations, Keith is alive today, still under treatment. Citations from both the Red Cross and Congressman Lujan were presented in President Sparks' office to the four, (from left) Emil Bernard (1761), Tom Maull (1715), Wayne Olson (1715) and Gayle Self (1761). President Sparks and Steve ReVeal, head of the Albuquerque Chapter of the Red Cross, look over the citations.

## Speakers

Bruce Hansche (1552), "Nondestructive Testing of Solar Reflectors," The American Society for Non-destructive Testing, Oak Ridge Section, Jan. 8, Oak Ridge, Tenn.

# For TTR People Happiness is a DC-9



The people of Sam Moore's Tonopah Test Range Department 1170 in Nevada should stake out a claim in the *Guinness Book of Records*: they regularly commute farther than just about anyone else, covering the 200 miles from Las Vegas to TTR every work day, morning and evening. They keep records of air mileage that each has accumulated, with Ken Johnson at the top of the list, having logged an astounding 858,060 miles since the flight commute began in 1969.

Now that's a bundle of miles and even if, like most, you've accumulated only a few hundred thousand, you begin to reflect on the creature comforts afforded by your mode of transportation. These days, TTR people smile when you mention commuting because they've come up with a new bird to take them back and forth—a DC-9 jet that flies the 200 miles in about half the time of the F-27 (which it replaces). With a capacity of 70, there's no crowding for the 45 or so regulars, and the plane is quiet and free of the vibration that characterized the propeller-driven F-27.

Ross Aviation is the carrier. Previously, with the F-27, the air crew and plane would remain at TTR through the long day, waiting for the Range people to complete their 10-hour day so that they could fly them back to Las Vegas. This was an inefficient use of the crew's time and of the aircraft and, for the crew, just waiting around was an exercise in tedium. With the superior speed and range of the DC-9, it is now possible for the aircraft and crew to make the morning run to TTR, then to make an intermediate-distance run to, say, Los Angeles, and still have ample time to return to TTR for the evening passage to Las Vegas. These photos show a typical flight to the Range.



**DAWN PATROL**—At the Las Vegas airport. It's early, dark and miserable outside so Range Manager Sam Moore checks on runway conditions at TTR. "A little snow" was the report and shortly thereafter the DC-9 flight to the range was underway.



**RANGE PEOPLE** board aircraft. Flight time between Las Vegas and Tonopah Test Range averages between 30 and 45 minutes, depending upon route. Introduction of jet service means considerable savings in flight time.



**SPACIOUS** cabin of DC-9 holds 70 people. With previous aircraft, an F-27, a limited passenger capacity occasionally meant that several people would be left behind at TTR during hot summer days because of diminished lift. Favorite in-flight activity involves closing eyes.

# A New System of Cryptosecurity

[Editor's Note: Asymmetric encryption, a new cryptographic system with revolutionary implications for both civilian and military secure communications, is the subject of this article (the first of two). It was prepared following interviews with Gus Simmons, Manager of Applied Mathematics Department 5640. Though asymmetric encryption had its origin in public-key cryptography as developed by Hellman and Diffie at Stanford, Gus and his colleagues have extended the application of it to encompass all types of secure communications.]

Most of us regard cryptography as the province of diplomatic and military staffs, spies and detectives—certainly not anything that affects our lives directly. But if your bank has electronic remote tellers, if you use remote “point-of-sale” account debiting in department stores, or if you expect to use the electronic mail system predicted by Postmaster General Bolger for the mid-80s, then cryptography is already of vital concern to you. Only cryptographic techniques can keep people from impersonating you, from tampering with your electronic authorization to buy or sell, or transfer funds—or, at a simpler level, to provide you with privacy in electronic communications.

To understand how cryptographic techniques are involved in such matters, we first have to understand the principles of secure communication. That's the subject of this first article.

Through most of history, cryptography has been what Gus Simmons calls symmetric. That means that both sender and receiver know and use the same secret piece of information—a “key”—to conceal and recover the message. If you know how the sender converted his message to cipher, you can generally reverse the procedures to convert the cipher back to the message. As Gus explains, the key in a symmetric cryptosystem is analogous to a key-operated deadbolt, locked and unlocked

with the same key. Locking is analogous to encrypting a message into cipher and unlocking corresponds to decrypting. The key makes it all possible.

Over the centuries, encryption schemes of great complexity have been developed to meet the needs of the government and the military. Since these systems were symmetric, however, if the key held by either the sender or the receiver was compromised, the whole system was compromised.

Many people, including that master of mystery, Edgar Allen Poe, whose story, “The Gold Bug,” is probably the most famous fictional use of cryptography, hold that “human ingenuity cannot concoct a cipher which human ingenuity cannot resolve.” In one sense, Poe may have been right, but he failed to reckon with what modern mathematicians call computationally complex problems—problems which can be solved in principle but not in practice because the number of computations involved makes it infeasible.

A modern highspeed computer (say the CDC 7600 or the CRAY) performs several million arithmetic functions per second. If a problem requires  $10^{15}$  multiplications (a quadrillion) for its solution, it will take over six years of continuous computing to solve it using a single computer—no matter how clever you may be. When the exponent becomes very large, say  $10^{100}$  or  $10^{200}$ , the problem is called computationally complex, meaning that it can't be solved in practice even though we know how to solve it in principle. This is entirely different from defining a problem as difficult to solve—which means we don't yet know how to solve it. The computationally complex problem is used to conceal the secret key, even when the opponent has copies of both the cipher and plain text messages.

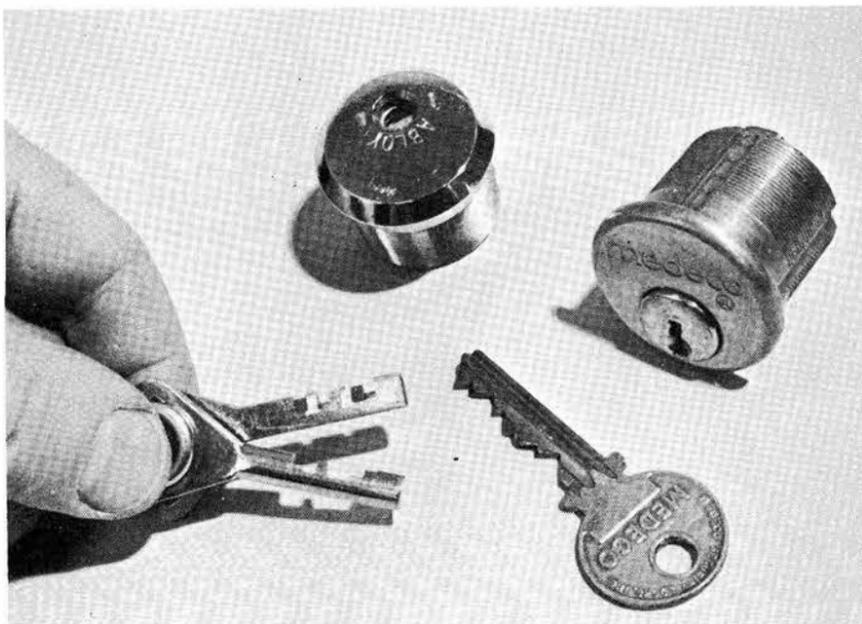
On BBC's TV series, “A Man Called Intrepid,” David Niven as Intrepid pointed out that by highjacking the German Enigma coding machine (without German

knowledge), English cryptanalysts had been spared a thousand years of mathematical computations (at the rate of one per minute). In actual fact, German ciphers produced by Enigma were routinely broken throughout WWII, not because Enigma wasn't based on a computationally difficult problem, but because the Germans failed to anticipate the electronic computer. Colossus, the first electronic computer, was invented and put into operation in England in 1943 specifically to work on Enigma ciphers. Enigma's encryption scheme was computationally complex, but only in terms of hand-operated calculators. The millions of computations required to crack Enigma were performed by the computer, not in a thousand years, but in a matter of hours.

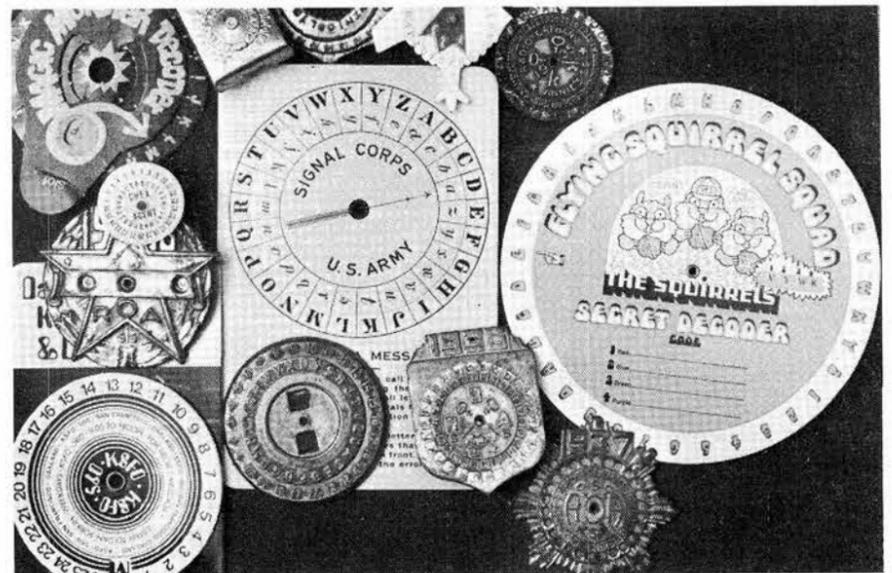
All cryptosystems in use today depend on computationally complex problems to conceal the key and without exception, they are all symmetric. Asymmetric encryption also depends on a computationally complex problem for key concealment, but the system differs: the sender and receiver don't have the same key. Their keys are not only totally different, but are related to one another by a computationally complex problem. In practice, one key cannot be inferred from a knowledge of the other.

Gus showed us a complex key-operated mechanical deadbolt made in Finland, pointing out that it made a good analog to the asymmetric encryption system. It has two different keys, one to lock it and one to unlock it. And the keys are apparently unrelated so that having one doesn't make it possible to manufacture the other.

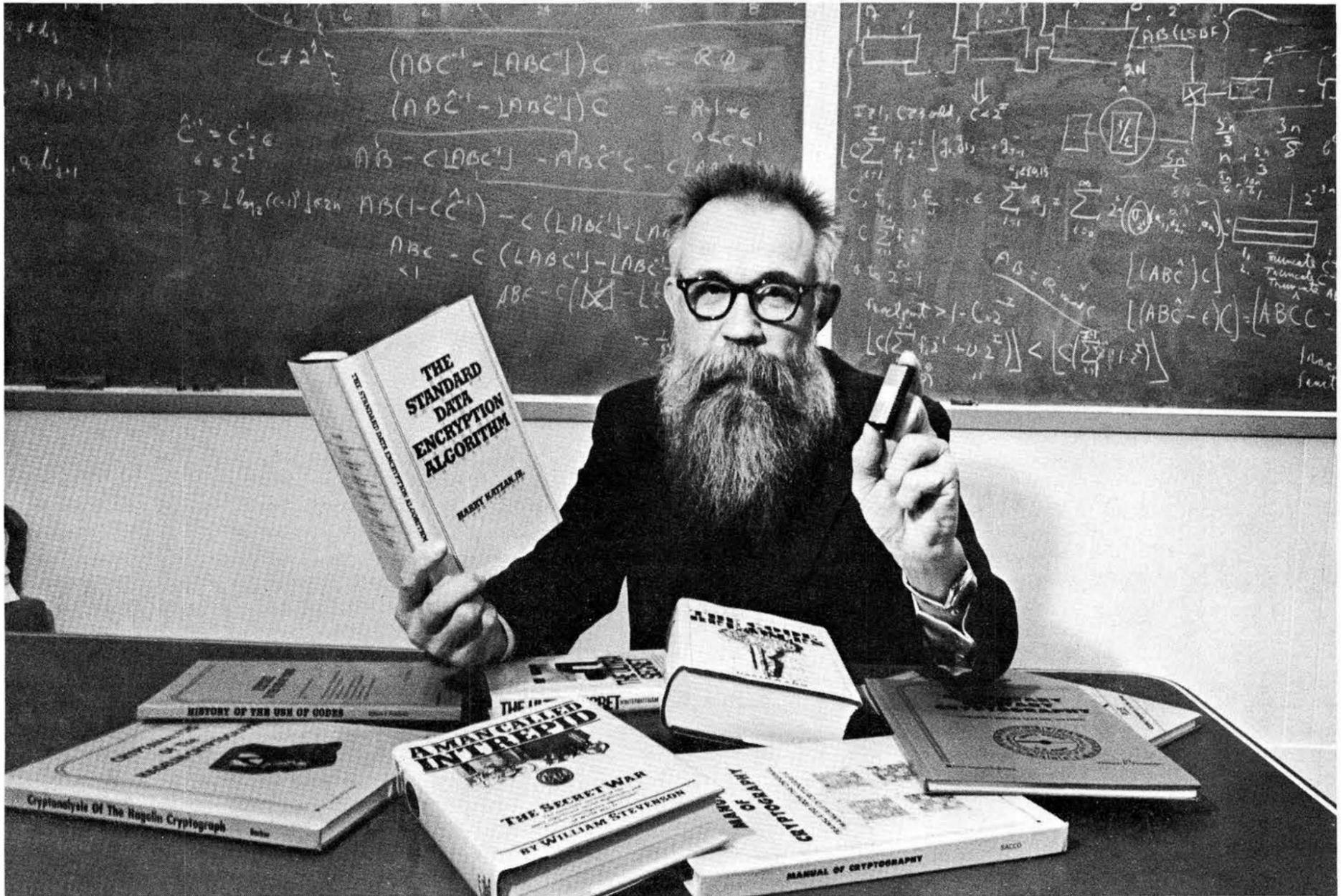
The Finnish lock has interesting applications. “Say you own a business,” Gus explains. “You give the locking key to every employee so that the last man out can lock up. But no employee can unlock the store—and even if an employee's key is lost, the store is still secure, because you keep the only key that will open it. This isn't a perfect analogy for asymmetric encryption,” Gus explains, “but it's very close.”



THESE TWO DEADBOLTS make good analogs of symmetric and asymmetric encryption systems. The one at the right uses one key both to lock and unlock. If the key is compromised, the entire system is compromised. The deadbolt at left uses one key to lock and a second key to unlock. The keys are apparently unrelated and one can't be inferred from the other. Losing one key doesn't compromise the other.



ONE OF THE JOYS of growing up in the '30s and '40s was hovering around the radio in the late afternoon to take down secret code messages from Little Orphan Annie or Sky King. All of the decoders shown here, including the Army Signal Corps decoder used through the '30s, worked on essentially the same principle: a numeral or letter was selected to represent the letter “a.” This established an offset relationship, a “new” alphabet and numbering system. To decode, you had to know, for example, that “f” in the coded version, really stood for “a.”



THE STATE OF THE SYMMETRIC ART. Gus Simmons, Manager of Applied Mathematics Department 5640, holds a pair of microcircuits in his left hand that provide the U.S. with a symmetric cryptosystem more secure than anything known in World War II. Capable of handling a million and a quarter bits of data per second, they represent the Data Encryption Standard approved

by the Bureau of Standards for federal use. But some experts question if they are computationally complex enough. Gus and his staff are working on a revolutionary new system, asymmetric encryption, which many feel is a giant stride forward in the art of cryptosecurity.

Having possession of one key doesn't compromise the other since you can't infer the shape of the second key from the one you have. And the number of computations (or steps) required to exhaustively test all possible key configurations is, in a manner of speaking, computationally infeasible because of the time and effort involved."

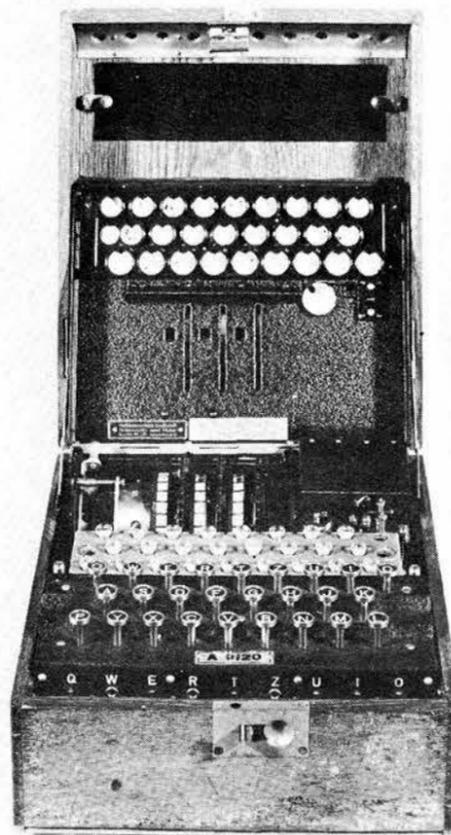
In the second part of this article, some applications of asymmetric encryption will be described. Meantime, you might find it interesting to consider how cryptography could be used to authenticate data from an unmanned monitoring system placed in a hostile host country to verify compliance with an arms limitation agreement. There are two stipulations: (1) the data must be provided the host country in a way that lets them verify that the message contains no unauthorized data, and (2) you must be able to verify that the information you receive is what the monitoring system actually sent, not false data sent by the host country to deceive.

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### Sympathy

To David Schafer (1542) on the death of his mother in Michigan, Jan. 7.

To Wanda Cupp (3332) on the death of her mother in Amarillo, Jan. 5.



THE FAMOUS GERMAN ENIGMA coding machine is based on a computationally difficult problem, but the Germans failed to anticipate the electronic computer. The English developed a computer and put the first one, Colossus, into operation in 1943 specifically to work on Enigma ciphers. The millions of computations required to decode Enigma messages were performed in hours. The same calculations, made by hand, would have taken a thousand years.

## Events Calendar

- Through Feb. 2—Woodwork exhibit — New Designs in an Old Tradition, Downtown Center for the Arts, 216 Central SW, Gallery Hours: Tues-Sat., 11-4 p.m.
- Jan. 25-26, Feb. 1-3—"The Marriage-Go-Round," Classics Theater Company, 8:15 p.m., Popejoy.
- Jan. 26—Lobo Invitational Track & Field Meet, Tingley Coliseum, 277-4031.
- Jan. 26—Albuquerque Dance Theater presents "Soundworks in Concert," AUA Gallery, 216 Central SW, 8 p.m., 242-2656.
- Jan. 27—"Bayanihan," Philippine Folk Festival Dance Company, 8:15 p.m., Popejoy.
- Jan. 29—"The Beauty of Sweden," travel-adventure film, 7:30 p.m., Popejoy.
- Jan. 30—"Death Trap," Ira Levin's Broadway thriller, 8:15 p.m., Popejoy.
- Feb. 1-16—"The Curious Savage," Albuquerque Little Theatre; Hours: Tues.-Fri., 8 p.m., Sat., 6 & 9 p.m., Sun., 2 & 8 p.m.
- Feb. 2—Picuris, San Felipe and Santo Domingo Pueblos: Annual Candelaria Day Celebration, buffalo and other dances; contact pueblos.
- Feb. 5—Paul Taylor Dance Company, 8:15 p.m., Popejoy.

## Fun & Games

**No Nonsense Self Defense**—If you hanker to learn all about your basic kicking, punching, grappling, eye gouging and the other refinements of street fighting, then join the C-Clubs's second No Nonsense Defense Class. It starts Feb. 6, runs for six weeks every Wednesday and Friday from 5 to 6:30 p.m. Cost—\$30. Three instructors will be on hand and the class is limited to 18 people. Call Skip on 4-8486 if you're interested.

\* \* \*

**Handball**—Skip at the C-Club wants to know if there's any interest in a handball-

only court reservation system such as now exists for Sandia racket-ballers. Call him on 4-8486 if you'd like to play.

\* \* \*

**Shooting**—Dave Overmier, 4-3436, of the Labs' Rifle & Pistol Assn. is looking for shooters to participate in the annual national postal matches. Categories include open and women's matches with air and .22 rifle and pistol. Dave says experience is helpful but not essential.

\* \* \*

**Skiing**—It is said that at a certain ski

facility to the north, a crowd of 4400 skiers showed up one day over the holidays and cars were parked some four miles down the road (the people had to be collected in the backs of company pickups and trucked to the area). For the privilege, each paid \$14. A friend has observed to us that alpine skiing is in its descendant phase (no pun intended), that the glory days are behind. We're inclined to agree. Skiing should be something more than an expensive hassle.

Meanwhile, an outfit called the New Mexico Ski & Travel Club is offering single day bus trips to Santa Fe and Taos each weekend. Cost is \$17.50 to Santa Fe, lift ticket included, or \$7 for bus service only. To Taos it's \$24, or \$12 for bus service only. You have to be a member of the club, at \$6; call 881-7832 for further information.

Cross country skiers will meet at Goodwill on San Mateo on Jan. 27, at 7:30 a.m., for an easy tour in the Jemez Mts. On the following weekend, Feb. 2, Carl Smith (1112) will lead a longish tour of Thompson Ridge in the Jemez (Goodwill, 7:30 a.m.), and on Sunday the 3rd, Dennis Grady (5532) heads a group into the Canjilon Lakes area (Goodwill, 7 a.m.). The latter trip will also tend to the long. These trips are sponsored by the New Mexico Ski Touring Club, and non-members are welcomed.

\* \* \*

**Running**—Andy Brito (1474) reports that a four-mile "Run For Their Lives" event is scheduled for Saturday, Jan. 26, at 12 noon at Kit Carson Park (Kit Carson Ave. and Laguna SW). Register at the park starting at 10 a.m., cost \$3.

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**Stress Reduction & Deep Relaxation**—A new course in stress reduction and deep relaxation will be offered after hours at the C-Club starting Feb. 4. The course combines the techniques of yoga and those developed in the West to remove the tensions of daily living and achieve deep relaxation. Each session includes exercises for tension release and 30 minutes of deep relaxation. Techniques for use throughout the day will also be demonstrated and practiced during the four-week course, which will be taught at the Club by Devi Frauenglass who has taught yoga at UNM since 1970. The class meets Mondays and Wednesdays, 4:45 to 5:45 p.m., and the fee is \$25. Call Skip on 4-8486 to reserve a place.

## Congratulations

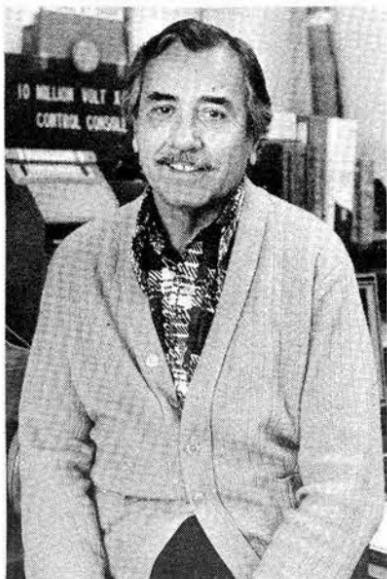
Laurence Ann Roberts (2153) and Kenneth Washington, married in Port Arthur, Texas, Dec. 29.

Mr. and Mrs. Gary Denison (2513), a son, Dec. 19.

Mr. and Mrs. Henry Pacheco, Jr. (3618), a daughter, Jan. 9.

Mr. and Mrs. Steve Kuehn (1583), a daughter, Dec. 11.

## Retiring



Thomas Eagar (1551)



Nina Clark (3715)



Ruth Scates (2425)



Earlene Brinegar (3532)



Howard Lindell (4311)



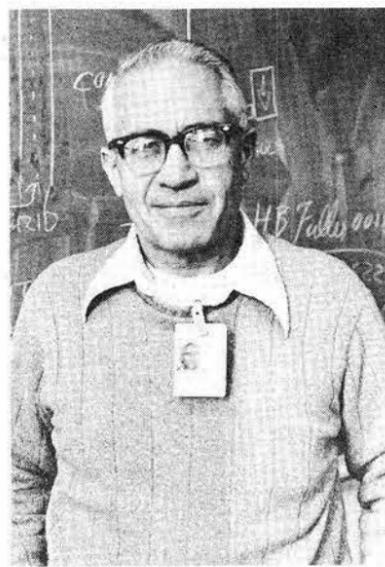
Ormand Williams (1471)



Charles DeMoss (1471)



Charles Gumley (2153)



Nick DeLollis (5813)

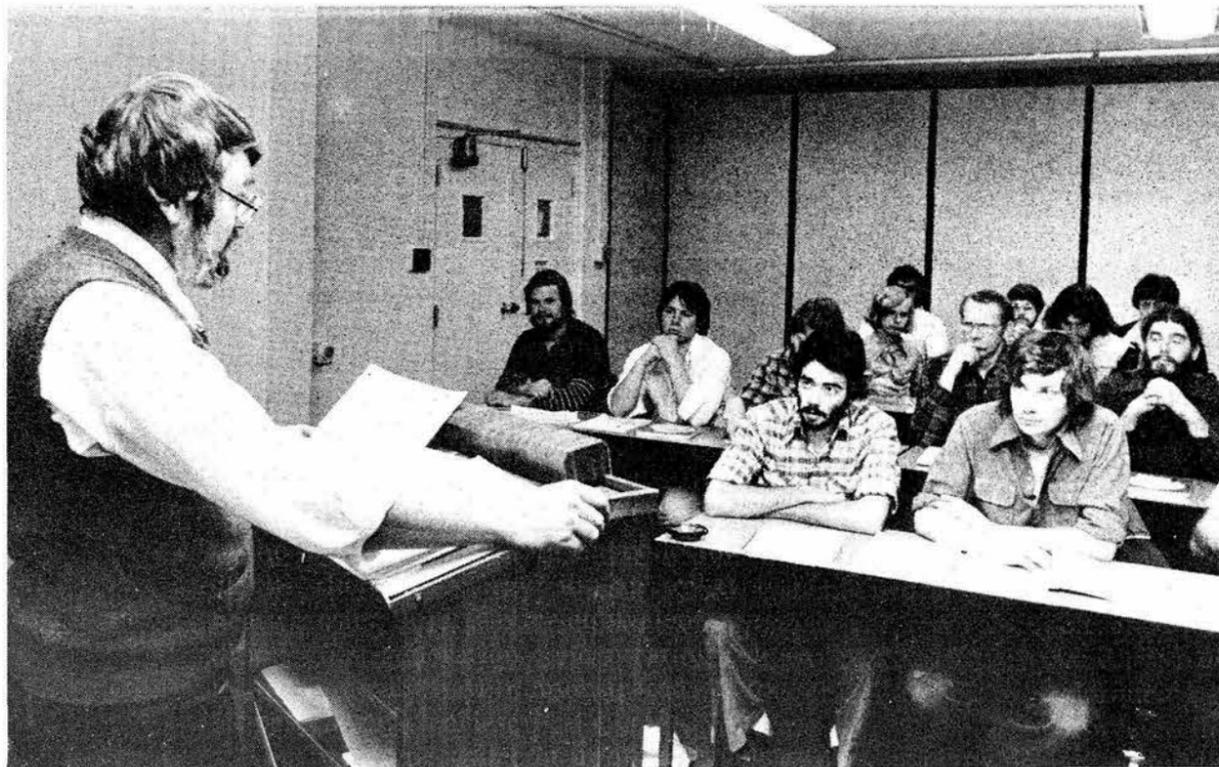
## 90 Supplier Reps Complete Class

Two classes entitled *True Position Dimensioning and Tolerancing* are wrapping up next week at the Coronado Club with some 90 representatives of local machine shops attending.

Invited by Tom Philbin (3715), a buyer handling overflow work from the Labs' Development Shops, the machine shop representatives attend six two-hour sessions. Ken Swanson (2327) is class instructor.

Course content concentrates on definitions, symbology, datum referencing and tolerances of location and form as used in Sandia's true position dimensioning and tolerancing system.

"We do in excess of \$10 million in business annually with local machine shops," Tom says. "With a better understanding of our drawings, they save time and effort and we save some money. The reaction I get from attendees is very positive—they appreciate the course."



KEN SWANSON (2327) instructs people from local machine shops in Sandia's True Position Dimensioning and Tolerancing System at the Coronado Club. Some 90 representatives completed the 12-hour course.

## Senator Schmitt Talks at Sandia

Jack Schmitt, U.S. Senator from New Mexico, was the featured speaker at a colloquium for Sandians on Jan. 10.

Addressing a full house, Senator Schmitt gave his perception of the mood of the Congress as it enters the 1980s. He sees a trend to deregulation following upon the successful deregulation of air fares and also sees an increasing concern among the Congress for national defense. Citing our weak conventional military forces, Senator Schmitt noted that we have significantly fewer men under arms than the Soviets and that the answer to this is an enhanced reserve component which could be mobilized within 30 days. He does not believe a draft would solve this problem because, under a scenario of immediate need, the training of recruits would take too much

time. Further, service careers must be made more attractive to gain good quality recruits and to keep those highly trained people already in the military.

Another aspect of this national picture is that of civil defense, which the Senator feels is largely neglected and in need of development. Our intelligence efforts need rejuvenation as well.

Senator Schmitt concluded with observations on the need for innovation in the U.S. and, as a corollary, the need for revision of patent law to encourage more innovation. And, as an alumnus of the space program, he noted that the space shuttle will likely go in the 80s but only after an infusion of more money, about one billion dollars.

A question/answer period followed the Senator's presentation.

*Continued from Page One*

## Special NP Part of the Medical Team

two-year program and, in addition to her NP status, has a master's in guidance and counseling. Gwen has been on-roll since June.

The NP concept originated at UNM's School of Medicine during the mid 60s. The rural community of Estancia, east of Albuquerque, had no physician and, after several months of unsuccessful recruiting, a registered nurse was given additional training at the medical school so that she could fill the slot. She moved to Estancia as a resident nurse practitioner, supported by the medical school, and was accepted by the community. The concept took hold, not only in rural areas, but in health care centers and clinics and in industrial medicine. Federal funding was made available for NP training programs.

The demand for NPs continues. One projection foresees more than fifty thousand NPs employed in various health care systems by 1982.

"National standards for NP training have not yet been established," Nancy says, "and, as a result, each state nursing board establishes its own. Compared to some states, requirements in New Mexico are pretty stiff. There's a minimum of 12 months medical training required because many NPs serve in rural areas without a physician on the premises. Since Gwen and I work closely with physicians, our own set-up here at the Labs is great. If we feel uncertain in any situation, we have immediate access to one of our doctors."

"Becoming an NP is a natural outgrowth of our nurse's training," Gwen adds. "We're able to use all of our RN skills, but we use them in a wider application of patient care, education and prevention of illness." •nt

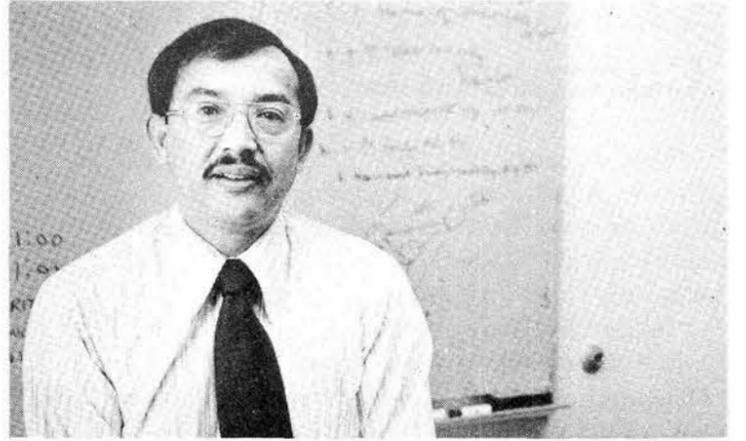
HERE AT SANDIA—Senator Jack Schmitt and Secretary of the Air Force Hans Mark spent a few hours with President Sparks earlier this month during a visit to the Labs. The Senator was featured speaker at a Sandia colloquium.



**MILEPOSTS**  
**LAB NEWS**  
**JANUARY 1980**



Bill Jacklin - 1736 20



Amado Trujillo - 4552 15



Ralph Wilson - 1770 30



John Gabaldon - 1531 10



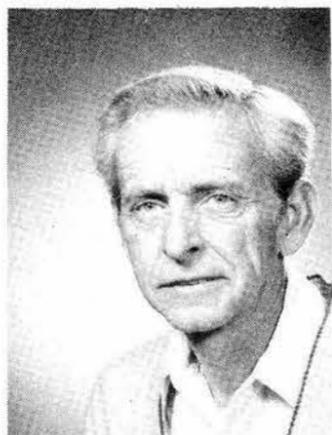
Margaret Crawford - 3450 20



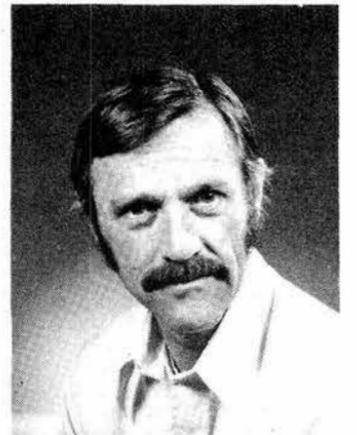
Ramona Anderson - 8214 15



Harry Farmer - 8252 25



Howard Lehman - 4311 20



Fred Wymer - 1244 20



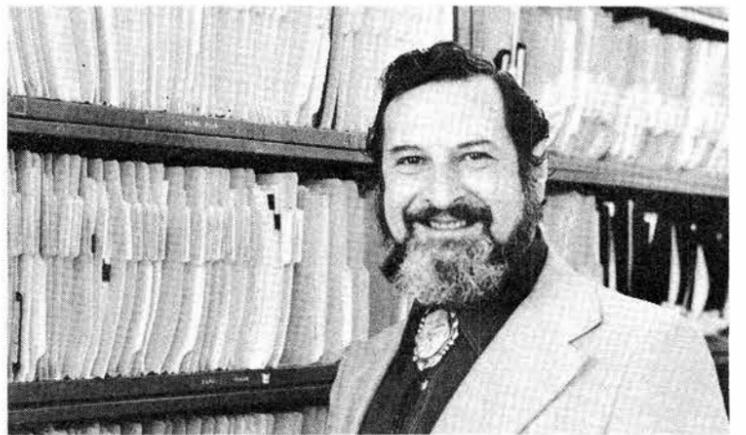
Merlein Keller - 2320 20



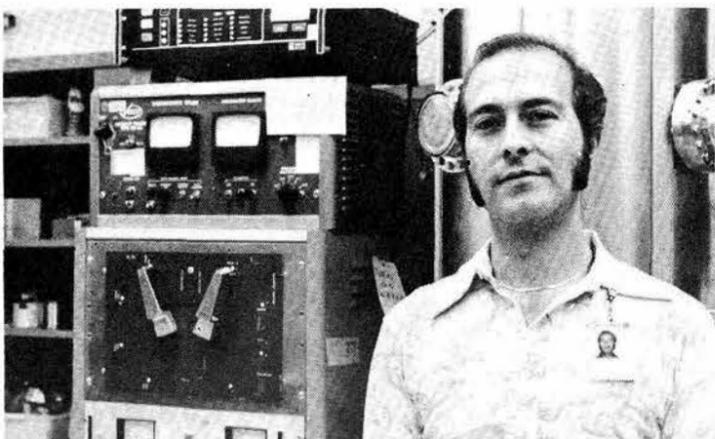
Louise Converse - 8411 20



Mildred Hill - 4414 15



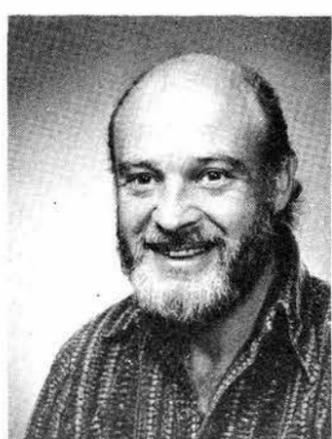
George Cosden - 3732 25



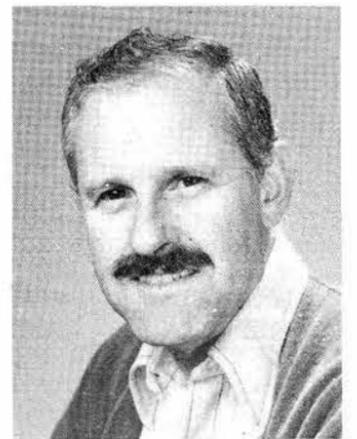
Rudy Lewis - 1471 15



Loyd Keller - 4344 25



Paul Cooper - 1132 15



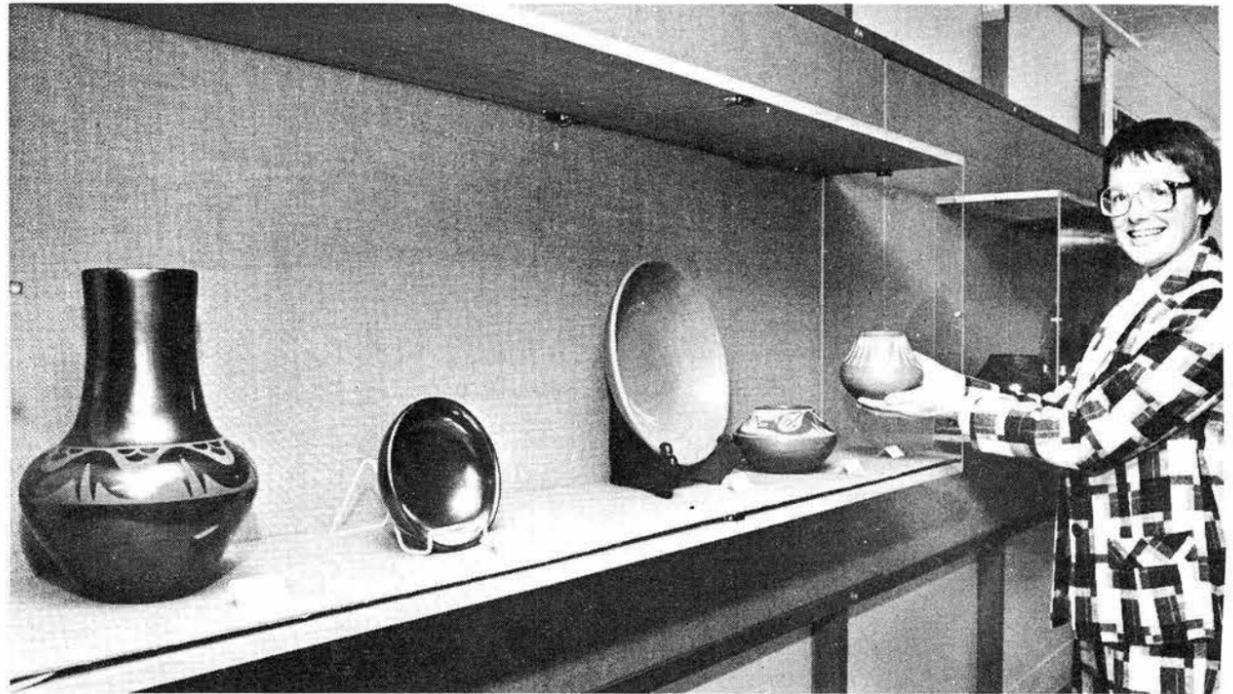
Ken Mitchell - 8116 20

## Baritone Sings Today

Today at noon (Jan. 25), baritone Carlos Serrano presents an informal concert in Bldg. 815. Carlos is an affiliate artist of the New Mexico Symphony Orchestra and is sponsored by the Levi Strauss Foundation. Brown baggers are welcomed.

## Steam Seminar Completed

Some 60 Plant Engineering and Maintenance people recently attended a two-day seminar on steam transfer technology conducted in-house by representatives of Engineered Equipment Inc., of El Paso. Part of Sandia's energy conservation effort, the seminar concentrated on steam transfer theory and applications with demonstrations of new ultrasonic sensors to detect steam flow and leakages. Hal Baxter (3652) coordinated the seminar.



MARIA the POTTER of San Ildefonso has won world-wide fame and Karen Shane (3161) here shows off some of that artist's choice specimens. Exhibit was set up by Karen in the foyer of Bldg. 802, runs through February.

## JUNK • GOODIES • TRASH • ANTIQUES • KLUNKERS • CREAM PUFFS • HOUSES • HOVELS • LOST • FOUND • WANTED • & THINGS

### CLASSIFIED ADVERTISING

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#### RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name & organization.
9. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

### MISCELLANEOUS

1978 PLYMOUTH Horizon AM radio, \$35. DeLollis, 299-5384.  
ADMIRAL upright deep freeze, 12 cu. ft., \$85. Esch, 292-0754.  
NATURAL GAS wall heater (interior wall only), \$40; crock pot, \$5; blow dryer, \$2.50. Anderson, 265-0403.  
DIAMOND, 1.8ct flawless (S1,F) in wedding set, appraised at \$18,500—write Box 14397, ABQ 87191 for appointment. Brainard.  
NEW END TABLE, walnut hexagon commode, contemporary, storage underneath, \$48. Paul, 299-6387.  
MOBILE HOME WHEEL, axle & spring sets, 14' wide, w/brakes, \$100 per set, w/brakes, \$80 per set. Danlovic, 869-6086.  
LIGHT FIXTURES, dining room & hall, modern style w/chrome, tinted glass & lg. bulbs. Costin, 292-2396.  
12 GAUGE, double barrel, muzzle loading, percussion shotgun, \$190. Mendel, 265-3840.  
REFRIGERATOR & freezers, copper-tone color, \$100 ea. Flores, 247-8990.  
TOY FOX TERRIER, 12-wk.-old male, registered, \$125. Miller, 299-6067.  
MATCHING couch & chair; coffee table & 2 end tables, best offer. Chapman, 296-4321.  
SHOP MANUAL set for 1974 Ford, Merc., etc., \$12; '74 Mustang thermostat, \$2. Roberts, 255-9527.  
WATCH BAND, man's, turquoise & silver, w/flex band for easy on-off, \$75. Hughes, 299-6674.  
REFRIGERATOR/freezer, 16 cu. ft., copper-tone, Westinghouse, \$175 cash. Owens, 299-0113.  
CUSTOM MADE single axle trailer, 4'x8'x2.5' bed, extendable tow bar, removable front & back end gates, double set of springs, \$400 or trade. Stuart, 299-9190.  
COUCH, 7' long, fall colors in lg. floral print, \$90. Schwartz, 294-1113.  
ELECTRIC RANGE, Frigidaire, dbl. oven, 40", white. Eifert, 299-3847.  
TYPING DESK, simulated wood grain, 32" wide, 22" deep, 26" high, \$35; typist's chair, \$25; shop manual for '72 Ford trucks. Waldorf, 293-0525.  
BOY'S 20" bike, \$30; child's cross country skis w/poles, \$10; Thomasville server, pecan wood, \$75. Cole, 293-6122.

NEW HOME sewing machine, \$65; B&S 5 hp engine, \$85; *Great Books of the Western World*, complete series, \$145. Hatcher, 266-0932.  
POLAROID CAMERA, \$30; brass fire screen, \$25; picnic table, \$10; upright vacuum, \$30; suede coat w/mink collar, \$45; canister vacuum, \$10. Samuelson, 821-5243.  
CARPETS: one red nylon, one gold short-pile nylon, each 11x12', \$40 ea. Clark, 298-4913.  
FORD AM/FM stereo radio, fits '71-78 cars & trucks, \$50. Neidel, 299-4369.  
AKC std. poodle puppies, whelped 10/10/79, all shots, house training, champion sired, show or pet. Baca, 294-5249.  
RIMS, 5 15", 5-lug from Ford Bronco, fit many models, fit 78-15 tires, all for \$40 or \$12 ea. Burton, 869-2541 after 5.  
ROCKING CHAIR, herculon covered, \$35. Martinez, 881-9396.  
SKIS, Hexcel Sundance 200cm w/Geze bindings, \$250; pr. cross country snow shoes, \$45. Honeycutt, 265-1062.  
CANOPY BED: top, mattress, box springs, \$150 or best offer. Eady, 294-3412.  
MISC. cactus, yours for the taking from the front yard of a Rio Rancho home. O'Neill, 898-5753 after 5.  
LANE oak end table, Legacy design, \$100; Hondaline helmet, \$35; convective tube grate, \$15; toaster oven, \$15. Chavez, 294-1253.  
SMITH & WESSON K-38 pistol, target grips & target hammer, w/carrying case, \$175. Hannum, 296-2095.  
FILM: 35mm Ektachrome, 100' roll, E-4 process, daylight, ASA 160, \$12 ea. Tipping, 296-3492.  
RED DOBERMAN PUPS, 2 females, tails & dewclaws cut, 11 weeks old, \$40 ea. Powell, 877-4939.  
FOOSBALL TABLE, foosballs included, \$300, negotiable. Copass, 296-4296.  
SIMMONS hide-a-bed sofa, blue-green, \$125. Combs, 292-4935.  
BRASS fireplace screen, \$10. Laskar, 299-1024.  
ACOUSTIC 150, 200 watt amplifier, solid state, six 10" speakers, \$435. Traeger, 298-0728.  
SEARS Craftsman industrial drill press, floor model, 1/2", 3/4 hp, \$325. Schroeder, 344-1011.  
PUPPIES, Malemute-wolf-shepherd mother, elkhound or malemute father, 4 males, 6 wks. old, 2 grey, 2 black, \$20. Hansche, 281-5623.  
30-VOLUME *Encyclopedia Americana*, 1949 edition, w/Cowles comprehensive encyclopedia "The Volume Library," \$35 or best offer. Pedersen, 293-8199.  
LIMED OAK bedroom set: dbl. bed, 5-dwr. chest, 4-dwr. dresser w/mirror, stool, no mattress, \$155; complete twin bed w/headboard, \$55. Stang, 256-7793, after 5.  
GUITAR, nylon strings, w/case, \$25. Drury, 293-1929.  
CRIB & HIGH CHAIR, mattress included. Krahling, 268-8126.  
SNOW TIRES; furniture; misc. Garage Sale, 1/27, 10 to 4, 920 Amherst SE. Teta, 821-5172.  
ENLARGER, 4x5, \$30. Edgar, 884-8567.  
GOLF CLUBS & bag for beginners, \$30; Chilton's repair manual for

Chevelle, Monte Carlo, El Camino, \$5; pinstriping kit for MG Midget. Barnard, 831-4114 evenings.

CHILD'S STEREO, AM/FM radio, 2 speakers, plays 45s and 33s, 6 mos. old, \$30. Norwood, 262-0073.  
POTTER'S WHEEL, electric w/splash pan, 0-275 rpm continuously variable, nearly new, \$225. Carlson, 242-4493.  
TIRE CHAINS for most 15" tires, \$10; fireplace grate, 21x18x23" w/five 2" dia. tubes, \$15. Freyermuth, 299-2053.  
RADIAL ARM SAW, 10", 2 1/2 H.P. w/extra blades, cabinet stand and casters, \$295. Ward, 884-9266.  
B&W TV, \$40; boy's and girl's size 7 figure skates, \$10 each. Taylor, 869-2934.  
HEAD 360 SKIS, 205 cm w/Cubco bindings, \$30. Sutherland, 266-1734.  
LOBO STADIUM SEATS, two new, \$4.50 ea.; wheel-about chair for disabled, \$50. Sublett, 884-4426.  
FOUR MUD & SNOW TIRES, Bridgestone radials, 155SR13, 5000 miles, \$125. Bell, 298-2446.  
MUNARI SKI BOOTS, size 7, \$25. Will trade for size 8 or will buy size 8. Doggett, 293-6210.  
TWO TWIN BEDS w/mattresses, box springs and frames. Newest set, \$75, other, \$50. Hernandez, 268-5000.  
26" BIKES, \$25 each; steerable toboggan, \$15; firescreen, 62"x35", \$50; plant light fixtures, \$10-\$15; laundry tub, \$15. Leenhouts, 344-3155.  
PATIO SLIDING GLASS DOOR w/screen and hardware, 8', \$65; 3-sp. man's bike, \$50. Hoffheins, 298-0017.  
BUCKET-TYPE MOTORCYCLE seat for GL1000 Honda; frame mount motorcycle fairing. Brock, 865-4055.

### TRANSPORTATION

'66 VOLKSWAGEN sedan, make offer. Thompson, 298-5800.  
'74 JEEP J-20 pickup, new tread, 35,000 miles, PS, PB, 1/4-ton 4-wd, \$2950 or reasonable offer. Downie, 293-1039.  
'76 10' Coachman camper, sleeps 6, self-contained; '73 3/4-ton Camper Special Ford truck, sold separately. Eisenberger, 293-5162.  
'74 INTERNATIONAL SCOUT II, 4-wd, 345 V8, AC, luggage rack, ready for towing, 68,000 miles, \$3300. Washington, 821-8622.  
'75 NOVA Custom V8, 4-sp.; new clutch, battery, tires, alignment, full tune-up & paint; converted for reg. gas, racing trans., twin pipes, \$2200 firm. Shrouf, 298-7755.  
'77 HONDA CVCC, AC, AM-FM stereo cassette, \$3500. Gallegos, 881-3289.  
BICYCLES: BMX Rampar, HD frame w/7" cranks; girl's 20" Schwinn, \$30. Lobitz, 821-1509.  
'77 SUZUKI GS400B motorcycle, 14,000 miles, \$850; Bell helmet, \$100. Clem, 296-5204.  
'67 FORD Ranchero, V8, std. trans., reg. gas, low mileage, \$995. Hayter, 294-0327 after 5.  
'76 CORVETTE, T-top, AM-FM cassette, all power, 4-sp., factory mags, \$7000. Brandvold, 296-4394.  
'69 PONTIAC Grand Prix, model SJ, \$1000 or best offer. Haggerty, 247-8039.

'76 MAVERICK 4-dr., AC, AT, custom pkg., one owner, 41,000 miles, lt. blue, upkeep records, \$2495. Flower, 298-0632.  
BICYCLES: two 10-sp., 24" wheels. Drumheller, 821-9627.  
'70 CHEVROLET Impala 4-dr. sedan, new tires, new brakes, AC, PS, PB, \$1000. Caster, 884-4950.  
'73 CHEVY 1/2 ton pickup, LWB, V8, PS, PB, AC, \$1100. Durand, 821-3064.  
BIKES: 20" girl's w/new thornproof tires, \$15; 20" boy's, \$15. Snyder, 296-5771.  
'75 FORD 3/4-ton Supercab Camper Special, 390 V8, 4-sp., loaded, 25,000 miles, w/8 1/2' cabover camper, \$4800. Romero, 821-7629.  
'73 CHEVY Impala, 350 V8, PS, PB, AC, reg. gas, \$950. Jones, 281-3617 after 5.  
'77 PONTIAC Sunbird, 25,000 miles, 4-sp., AC, AM, new tires, velour interior, 28 hwy, 20 city, \$3500. Lujan, 299-9600.  
'74 MAVERICK Crabber, new 302 engine & clutch assembly, radials, 3-sp., \$2000. Arroyo, 299-9600.  
'76 FORD Granada, 4-dr., PS, PB, AC, recent brakes, muffler, tailpipe, tuneup, \$275 below book, \$2500. Domme, 255-0133.  
'71 BLAZER and 16' Vistaliner camping trailer, sell or trade for Honda CVCC. Conklin, 298-8217.  
'65 FORD wagon, 352 V8, AT, PS, air-lift shocks, reg. gas. Muir, 883-7933.  
'77 MALIBU, 4-dr., V8, AT, PS, PB, AC, AM-FM, radials, 26,700 mi., \$3000 or best offer. Pershall, 822-0814.  
'72 DODGE Dart Demon, 2-dr., AT, PS, AC, 318 V8, \$1000 or best offer. Galloway, 268-0463.  
'73 DODGE 1/2-ton Club Cab pickup, 4-sp., PS, PB, camper cover, low mileage. Jones, 299-9032.  
'75 FORD Granada Ghia, 302 V8, PS, PB, AC, auto. floor shift, vinyl top, \$2600. Chavez, 281-1703.  
BICYCLE, 26-in., 5-sp., Sears, \$35. Mason, 299-2836.  
'77 MONZA coupe, 4-cyl., 4-sp., new clutch, low mileage. Jefferson, 243-3529.  
'62 CROWN IMPERIAL, 4-dr. HT sedan, best offer; Hardwood dining set, china cabinet, table, 6 chairs, \$400; right front fender, '65 Ford, \$5. Hayes, 299-1200.  
'69 FORD window van, cruise control, elec. ignition, AT, V8, bed, chuck box, 57,000 mi., new tires & battery, \$1800. Stuart, 299-9190.

### REAL ESTATE

MOBILE HOME appraised at \$7930, asking \$6800, set up in adult park 1 blk. from base. Gumprecht, 265-3571 or 296-6566.  
10 ACRES LAND off S. 217 on county road. Hands, 836-5919.  
ASSUME 8% loan on 1-yr.-old 4-bdr., 2 bath, dbl. garage, wrought iron bars (fire escape), screen doors, cul-de-sac, landscaped, \$59,900. Haggerty, 247-8039.  
BRICK 3-bdr., den, 1860 sq. ft., oversized lot, RV access, many custom features, located near SHS. Barber, 296-0462.

2300 SQ. FT., 4-bdr., Paradise Hills, 1 1/2 bath, new carpet, 2-car garage, lg. corner lot, pitched roof, landscaped, \$61,500. Skender, 898-5647.  
CONDOMINIUM, 1-bdr., under \$30,000. Small down and assume 8% loan for balance. File, 299-7836.  
MOUNTAIN HOME, 3-bdr., 3 baths, 360 degree hilltop view w/guest house and large rec room. Moon, 883-4383 or 296-6512.

### FOR RENT

3-BDR., 1 1/2 bath, LR, lg. kitchen, fp, 1-car garage, covered patio, reffrig.-freezer, W&D, \$350/mo. Luna, 298-3571.  
3-BDR., 1 1/2 bath, fp, carpet, drapes, 8-yr.-old house, landscaped, Juan Tabo & Menaul near park, \$425. McCoy, 821-2509.  
1-BDR., \$160 plus gas & elec., near Sandia, children OK, no pets, \$100 deposit. Boverie, 255-1071.  
3-BDR., 1 1/2 bath, near Manzano High, enclosed front & back yard, extras, \$395. Lindsay, 299-7454 or 256-7190.  
3-BDR., 2 baths, furnished, avail. Mar. 10, 4-6 mo. lease, \$500 mo., 1st. last, DD. Rowe, 821-8251 after 5:30.  
3-BDR., 1 1/2 bath, fenced yard, near Tramway & Copper NE, water paid, \$350 mo., 1st & last mo. rent plus \$100 DD w/lease. Caldes, 281-3272.

### WANTED

RIDE OR CAR POOL from Hendrix-Morris area to Tech Area I. Putz, 298-7009.  
INTERESTED in a 2-week trek in the Atlas Mountains of Morocco in the fall of 1980. Mattox, 821-3945.  
LAWN MOWER, good manual push-type. Bonzon, 296-3022.  
ONE MORE car pool member from vicinity of Rio Grande NW and Candelaria NW. Knoff, 344-6623.  
ELECTRIC ROASTER. O'Neill, 898-5753 after 5.  
"De GRAZIA" articles: needlepoint canvas, prints, bells, lamp, etc.; antique highchair. Chavez, 294-1253.  
TRADE: cartridge case guard, small rifle, .7 Rem., .222, .223, 6-47; want large rifle case guard. Stuart, 299-9190.  
TO JOIN car pool from Paradise Hills. Arnold, 898-1467 after 5:30.  
TO JOIN OR FORM car pool from San Pedro/McLeod area, preferably to Gates 1 or 11. Whiteley, 881-1572.  
CAMPER SHELL for short or long wide bed pickup; 235-15 radial tires, 4 air shocks for Lincoln. Brock, 865-4055.

### LOST AND FOUND

LOST—Woman's 14K gold chain, silver rim bifocal glasses, plastic type eye glasses in thick case, car keys, brown LH glove, lined LH black glove, white gold pierced earring, blue hooded warm-up jacket, man's tan tri-fold wallet, pierced mother-of-pearl earring.  
FOUND—Ballpoint pen, car keys, dental plate, golfer's hat. LOST AND FOUND, Bldg. 814, Rm. 1, 264-5677.

# Veal Tonight, T-Bones Mañana

**HAPPY HOUR TONIGHT** features veal cordon bleu on the buffet, Bob Banks and Trio on the bandstand. Denny and guitar entertain in the lounge from 5 to 7. Next Friday, Feb. 1, Fred Gómez plays in the lounge, the Carter Express in the main ballroom. A Mexican food buffet will be spread. To reserve buffet tickets, call the Club office, 265-6791 by mid-week.

**VERY LARGE T-BONES** are on the menu tomorrow while the Freddie Chavez Foundation plays for dancing. It's the big event of the month. Call the Club office *right now* to see if any tickets are left.

**A MAJOR REPAIR** project necessitates closing the Club Monday, Jan. 28, through Wednesday, Jan. 30. Regularly scheduled events will resume on Thursday, Jan. 31.

**INAUGERATED** two weeks ago, the Wednesday Happy Hour was an instant success. Where else, except at the Coronado Club on Wednesdays between 4:30 and 6:30, can you buy a standard mixed drink or draft beer for two bits?

**POLLYANNA**, the story of the little girl eternally optimistic, is the classic movie to be shown on Variety Night, Saturday, Feb. 2. Super sandwiches are available at 6, magician Don Marchi (2515) presents a magic show at 7, the movie starts at 7:30. Admission is free to members and families.

**SINGLES MINGLE** at a new time next month—Tuesday, Feb. 5, from 4:30 to 6:30 at the north end of the ballroom near the main lounge. Zip Zipprich (4451), singles club honcho, promises conversation, music, snacks and door prizes at the get-together.

**MEMBERSHIP** in the Coronado Club is the best private club buy in the city. And the Club's Board wants to prove that. All Sandia and DOE employees are cordially invited to an evening of freebies on Thursday, Feb. 14. An open bar, snacks and the word on all the Coronado Club recreation and special interest groups are the features of the evening. Drop by around 7 p.m.

**TRAVEL DIRECTOR** Frank Biggs (4231) reports that the Puerto Vallarta trip announced last issue is filled, but another is planned—same deal—at a slightly later date. Also in the mill is a trip to Cancun in late Spring.

In the meantime, there's Disneyland during the spring school break. Fly there April 1, return April 4, stay at a hotel across from Disneyland, enjoy two day's admission to the place with rides and other attractions. Cost is \$253 for adults, \$179 for kids.

Frank will be in the lobby tonight from 6 to 7 to discuss your travel plans. Where would you like to vacation?

**UPCOMING EVENTS**—Western Hoe-down with Elton Travis and the Westernaires, Feb. 16; Kiddie Karnival, Feb. 23; Grandsquares Valentine Party, Feb. 11; Sanado Potluck Supper, Feb. 12.

## Take Note

John Gardner (3140) is director of "The Marriage-Go-Round" opening tonight at Popejoy Hall, a presentation of the Classics Theater Company. John helped organize the group 10 years ago, has directed most of their productions. The current play is described as a "naughty comedy." It had a long run on Broadway and was later made into a movie. The show will run tonight and tomorrow, repeating on Feb. 1 and 2 with a Sunday matinee Feb. 3. Call 277-3121 for ticket reservations.

Karen Shane of Public Information Division 3161 is updating the Sandia Speakers Bureau. The Bureau provides speakers to various organizations, civic groups, schools, etc. If you have a work-related talk you would be interested in presenting occasionally, send her a title and abstract.

A reminder: on Tuesday, Jan. 29, from 12 to 12:30, Dr. Al Federavicius will talk in Bldg. 815 about stress and how we can learn to handle it. The speaker is a staff psychologist at the VA hospital in Albuquerque. On Feb. 5, a class in stress management begins, presented by clinical psychologist Arlene Price of Sandia Medical. The class meets Tuesdays and Thursdays from 12:30 to 1:30 for eight sessions. Call Arlene on 4-8038 if you are interested.



DON MARCHI (2515), who is a professional magician in his off-hours, appears Feb. 2 at the Club's Variety Night. The show starts at 7 p.m. Admission is free to members and families.



MORE THAN 50 hats are in Chuck Ray's (4737) collection of advertising caps, but he's wearing his favorite—a Sandia Labs cap sold by LAB NEWS to aid the South Highway 14 charity project. Chuck has collected the caps over the past two and a half years in his field work for Sandia geo-energy projects—deep steam, oil shale and coal gasification. The Sandia Labs caps sell for \$4.25, are available at the LAB NEWS office, MO125 (located just east of Bldg. 814).

Featured speaker at the Jan. 30 Sandia Colloquium will be Lilli Hornig from Wellesley College and the Higher Education Resource Services. Ms. Hornig's topic is "Women in Science."

The Alliance Francaise d'Albuquerque is again offering French conversation classes at all levels. Day or evening classes, taught in the informal atmosphere of the instructor's homes, begin the week of Jan. 28. Cost is \$48 for the 12-week session. A "French for Travelers" class is also offered. Call 242-1880 or 243-4187 for further information.

