

## Beckner, Peurifoy Fill V-P Slots

Two new vice-presidents were named last week by Sandia's Board of Directors. Bob Peurifoy, who was director of Weapon Development 9300, is now vice-president of Technical Support 7000. Everet Beckner, who was director of Energy Programs 9700, is now vice-president of Energy Programs 6000.

The changes, effective July 1, included some reorganizations as well. The new Energy Programs vice-presidency under Beckner will include solar and geo energy, waste management and transportation, and nuclear fuel cycle programs. Peurifoy's new Technical Support vice-presidency will include field engineering, systems evaluation, materials process engineering and fabrication, development testing, and the design information center. Orval Jones will head Defense Programs 5000: weapon development, nuclear security systems, and instrumentation systems. The General Attorney, Secretary, Treasurer vice-presidency is renumbered 4000 and will report directly to President Dacey as will Comptroller 100 and Management Staff 400. The Research 1000, Component Development 2000, and Administration 3000 vice-presidencies will continue to report to Al Narath (10) as will Systems Studies 300. Organizations 5000, 6000, 7000, and 8000 (the latter unchanged) will report to Tom Cook (20).

Peurifoy joined Sandia in 1952 and worked in the systems development organization. He was promoted to section supervisor in 1956 and became supervisor of the warhead electrical systems division in 1958. He was named manager of the explosive device department in 1961. Since that time he has headed the advanced systems research, exploratory systems study, systems development, exploratory systems development, and exploratory programs departments — all at Sandia Albuquerque — and the test and advanced systems research departments at Sandia Livermore. He has been director of weapon development since 1973.

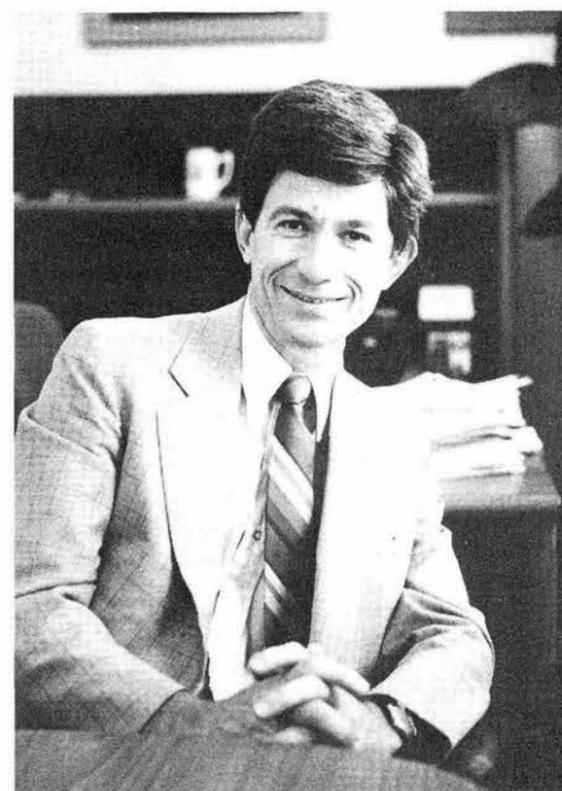
He earned a BS in electrical engineering at Texas A&M in 1952. In 1977 he won the ERDA Distinguished Associate Award. He and his wife Barbara have three grown children. The Peurifoy's live in southeast Albuquerque.

Beckner came to Sandia in 1961 as a plasma physicist. In 1965 he was named supervisor of the electro-physics research division and was promoted to manager of the plasma physics research department in 1970. He later managed the laser physics research department before his promotion to director of physical research in 1973. In 1978 he became director of waste management and geotechnical projects; he has been director of energy programs since 1982.

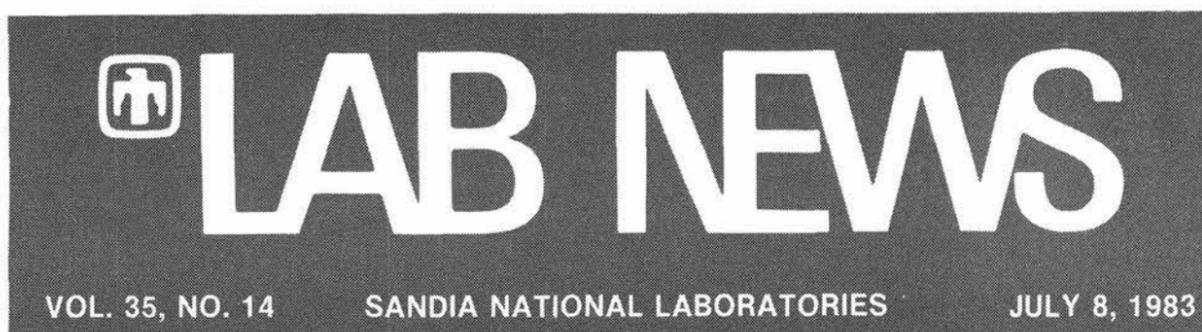
He earned a BS from Baylor in 1956 and an MA and PhD from Rice in 1959 and 1961, respectively, all in physics. He and his wife Claudia have three children, one still at home. The Beckners live in southeast Albuquerque.



BOB PEURIFOY (7000)



EVERET BECKNER (6000)



### Invaluable

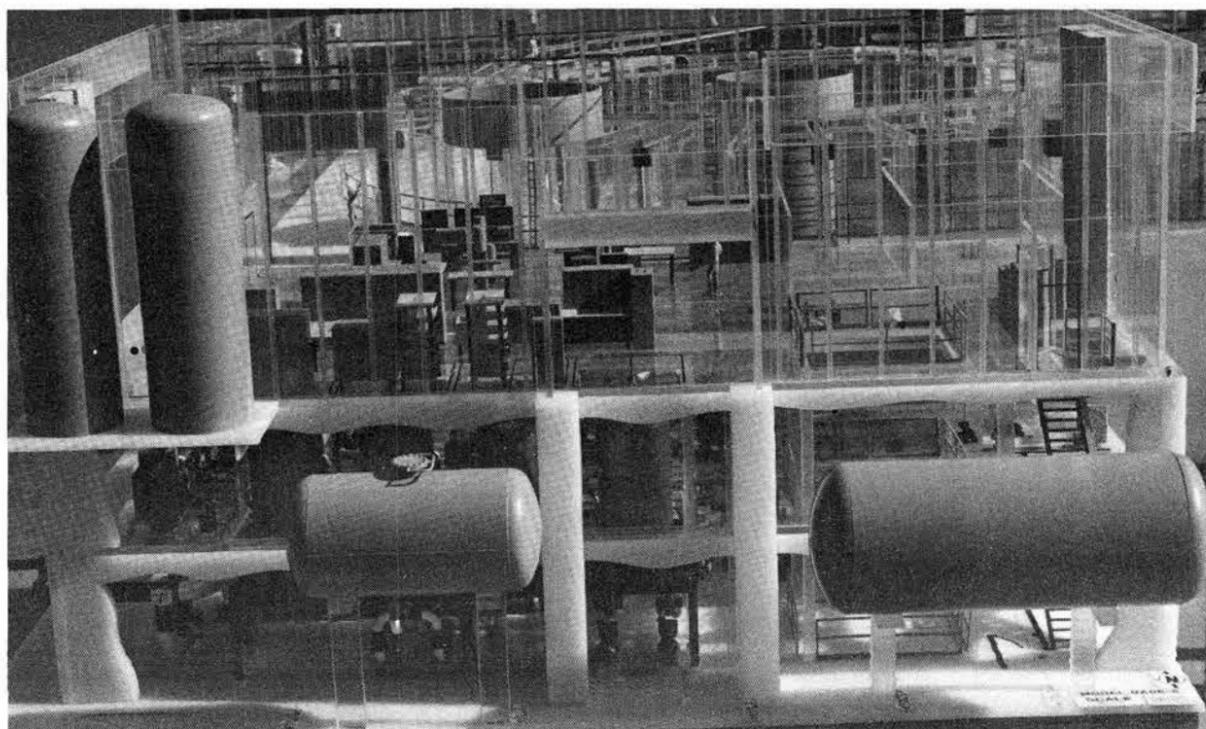
## PBFA-II Model Is Design Tool for Construction

In a project as large and as complex as the PBFA-II fusion machine, engineering models constructed as the design progresses are proving invaluable. Models are saving time, saving money, and — more important — making possible many improvements in design before construction starts. Cost savings achieved to date through the use of models have substantially exceeded

the cost of the models.

Here's an illustration:

Before the floor, basement, and foundation for the massive accelerator were poured in Bldg. 983 (which will house PBFA-II), the Sandia contract model builders started construction of a  $\frac{3}{8}$ -inch-to-the-foot scale model. Several inconsistencies in  
*(Continued on Page Six)*



COMPLEXITY of support systems for PBFA-II is revealed in this model. Work on the model parallels design and actual construction of the full-scale facility. Spatial relationships become immediately apparent in the three-dimensional model. Everyone on the project can visualize progress of PBFA-II.

# Antojitos

Nobody Reads the Fine Print--or do they? Those of us on the LAB NEWS staff know how insidiously typographical errors, or typos, creep into print. Our technique is to proofread as carefully as we can, then put out another issue so readers have only two weeks to find the typos. Last issue we spelled been as been. We're not perfect.

So we (and, judging by the phone calls, many other Sandians too) are amused, but not perplexed, by the typos that crept onto the back of our new badges. The fine print tells us that "Return postage is guaranteed" and that "alternation" or "mis-use" of the badge is illegal. Misuse is one word. Alternation is a perfectly good word, but we believe that badges are not to be altered--it would be difficult to alternate badges when we each have only one.

The zip code problem is more difficult. Each caller has a different theory as to Sandia Albuquerque's proper designator--87115 or 87185 or both. Apparently we need some guidance here. (Maybe a Weekly Bulletin item? Help!)

But the most challenging word on the badge was spelled correctly. That word is Its, with no apostrophe. Contrary to usage common in our local daily newspapers, its is the possessive form (like his), and it's is the contraction for it is--"It's a wise dog that knows its own father," for example.

Back to typos. Unlike the newspaper business, where today's issue makes the last issue obsolete, the badge business will have to live with the mistakes for five years or so. It reminds me of a bit of doggerel designed for an editor's tombstone--maybe mine:

I suffered so much from printers' errors  
That death for me can hold no terrors.  
I'll bet this stone has been misdated--  
I wish to God I'd been cremated.

●BH

No escupas al cielo porque a la cara cae. (Don't spit at the sky, for it will fall on your face.)

## Supervisory Appointment



LEO DOYAL to supervisor of Integrated Circuit Test Section 2124-1, effective June 17.

Joining the Labs in 1961 as a document clerk, Leo has since worked in data reduction, upper atmospheric research, and neutron tube development. Since 1975 he has been with the integrated circuits organization.

Leo earned a BS in math from the U of A and has done graduate work in EE at UNM. He enjoys gardening and bird hunting, but his primary interest is flying; he's a licensed pilot for both powered and sail planes. Leo and his wife Betty have three children and live in NE Albuquerque.

## Drama Project Presents Show July 8-9



Where did the lava at Mount St. Helens come from? Directly from the mantle of the earth, at least 30 miles below the surface, according to most geophysicists. But David Blackwell of Southern Methodist University in Dallas has taken heat measurements in drill holes along the Cascade Mountains, and he concludes that there's an enormous chamber of molten and near-molten rock a mere five miles below the surface. His controversial theory suggests that this magma chamber is at least 20 miles wide and extends for at least 100 miles beneath the Cascades, which would make it the largest such feature known anywhere on earth.

— Science 83

Gary Shepherd (2614) reports that the Neighborhood Drama Project, 1020 Edith SE, is sponsoring an evening of fashion, song, dance, drama, and comedy tonight and tomorrow at 8 p.m. Gary, who has written, directed, and produced the shows presented by the NDP for more than 10 years, says he's particularly proud of this production.

"Many of our participants have had as much as eight years of training with the NDP. In fact, some of the participants are

now married and have children of their own. Our youngest model in the young people's fashion group is four, and the eldest in our adults group is a senior citizen. One of my eight-year guys wrote a short one-act play called 'A Scene from the Street' which deals with some particular black cultural problems. This has been a fun show to put together, and we think the community will enjoy it as well."

Admission is a \$2 donation to NDP. Youngsters 12 and under admitted free.



# LAB NEWS

Published Fortnightly on Fridays

**SANDIA NATIONAL LABORATORIES**

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO  
LIVERMORE, CALIFORNIA  
TONOPAH, NEVADA

Editorial Offices in Albuquerque, 87185  
Phone 505/844-1053 FTS 844-1053  
In Livermore 415/422-2447 FTS 532-2447

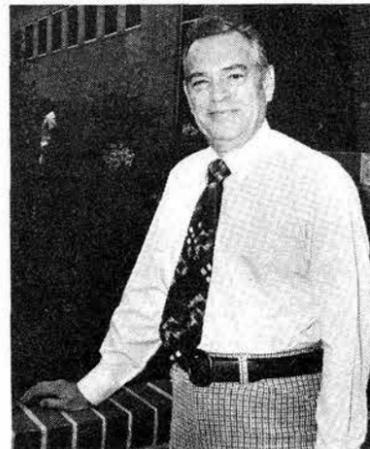
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## Retiring



Ernesto Griego (7482)



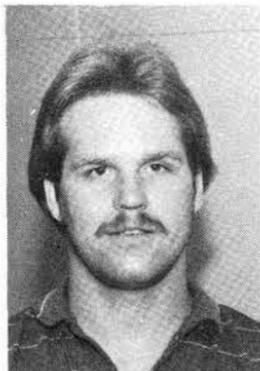
Ted Huebner (3723)



George Janser (2514)



SUSAN HEGLEY



CRAIG TAYLOR

TWO SECOND-YEAR Chabot College students have been awarded the Sandia science and engineering scholarships for 1983. Winners are Susan Hegley of Pleasanton and Craig Taylor of Livermore. Susan will attend UC Davis in the fall and major in mechanical engineering. This summer she is working in the Experimental Solid Mechanics Division 8123. Craig plans to attend Cal Poly at San Luis Obispo and major in electrical engineering. His summer job is in the Computer Applications Division 8334. Both students received \$300 checks as well as the summer jobs at Sandia.



WORK EXPERIENCE STUDENT Celia Belena (8161) recently received the 1983 Outstanding Work Experience Student award at Livermore High School, sponsored by the Livermore Rotary Club. Here she shows the permanent plaque with her name added for the school to Paul Dominguez, her supervisor at Sandia. Her sister Tina was the recipient of the same award in 1981-82.

## Take Note

The Tuff Stuff team won both halves of the winter Sandia Mixed Handicapped Bowling League. Members of that team are Shirley Carson (8336) and husband John, Paul Dominguez (8161) and wife Vanette, Don Knaple (8273), and non-Sandian Bill Baer. The second place team, the Tigers, consisted of Bill Little (8270) and wife Helen, Kit Marino (8414), Mary O'Shea (8214), Roger Baroody (8410), Dick Houser (8412), Bruce Koopman (8274), and his wife Jane.

Sandia women who were sweeper winners the final night of the league include Kit Marino with a 620, Debra Crooks (8275) 607, and Eva Leong (8264) 604. Male winners were Jerry Williams (8272) with a 722, Ed Christensen (8444) 694, Don Knaple 672, Dick Sundahl (8465) 660, John Martin (8161) 654, and Sandia's Wells Fargo security force member Steve Warn with 633.



SCIENCE DEFINITIONS  
FOR OUR TIME (Cont'd)

GOD *n.* Darwin's chief rival.  
— *New Scientist* quoted in *World Press Review*



# SANDIA LIVERMORE NEWS

VOL. 35, NO. 14

SANDIA NATIONAL LABORATORIES

JULY 8, 1983

## Get It While It's Hot

# New Method for Analyzing Coal Combustion

Coal is one of the most plentiful energy resources in the U.S. However, when burned in conventional pulverized fuel combustors, it is also a major contributor to air pollution. Reggie Mitchell of Combustion Research Division 8521 is in charge of the Coal Lab, where his experiments with coal and other pulverized fuels are leading to new ways of burning fuels more efficiently and thus with less pollution.

The Coal Lab is the site of experiments designed to find out exactly how a coal particle burns. That task means determining its burning rate and examining the physical and chemical changes the particle goes through as it burns. "We've devised a technique never used before on a single, burning particle," says Reggie, "and that is to measure the particle's temperature while it's reacting."

In a hot, oxidizing gas environment, particle temperatures are usually higher than those of the surrounding gas because of exothermic reaction at the particle surface. By measuring the gas and the particle temperatures, Reggie can determine the overall particle burning rate by comparing its heat generation rate with its conductive and radiative heat loss rates.

When particles are injected into a hot environment, their volatiles are released, leaving a carbon structure, or char, that has to burn out in a heterogeneous reaction. It is during this char burnout period that Reggie makes the crucial temperature measurements.

Key to such measurements is a laminar flow reactor that permits direct observation of the burning particles. The reactor was designed by Reggie and Bill McLean (Combustion Chemistry Division 8513). The flow reactor provides a well-defined environment, typical of those found in pulverized fuel combustors. The char particles have an average diameter of about 100 microns — larger than a grain of talcum powder but smaller than a grain of salt. As the char particles burn, they give off a radiant emis-

## Sympathy

To Larry Brandt (8328) on the death of his father in Springfield, Oregon, May 13.

To Dick Feil (8461) on the death of his mother in Petaluma, May 18.

To Steve Margolis (8331) on the death of his wife in Danville, June 13.

To Glenn Smith (8272) on the death of his father in Stockton, May 29.

To Allen Salmi (8521) on the death of his brother in Oregon, May 8.



IN COAL LAB, Reggie Mitchell (8521) experiments with coal and other pulverized fuels to find ways of burning them more efficiently. Reggie has devised a new technique to measure a single particle's temperature while it is reacting.

sion, the intensity of which is related to the temperature by Planck's Law: The higher the intensity of emission, the higher the temperature. "In other words," says Reggie, "the brighter the particle, the hotter it is — like a light bulb."

The researchers also developed a two-color pyrometer, an instrument that measures radiant emission at two wavelengths or colors. As the particles flow through an optical sampling area in the middle of the reactor, their emission at two wavelengths is recorded with an arrangement of optical lens, beam-splitter, monochrometers, and photomultiplier tubes. The output voltage signal from each photomultiplier tube is proportional to the light intensity at the wavelength monitored.

"Since the emissivity of coal particles isn't known," explains Reggie, "we assume coal particles behave as graybody emitters. Since the emissivity of a graybody is independent of wavelength, the ratio of the emitted light intensities at the two wavelengths leads directly to the temperature of the emitting body."

This original work on coal combustion has expanded into a number of related coal-science and combustion projects to the point that Sandia is now among the major research groups in the world. "We have been invited to present our work in most major international conferences, and it continues to grow in importance and in impact. It's very exciting," adds Reggie.

## **New Satellite Communications System Planned Here**

A new 11-meter (36-foot) diameter antenna mounted near the southeast corner of the Computer Annex of Bldg. 880 is the most visible step in a long-range plan by DOE to do virtually all of its communications via satellite. Ultimate goal of the plan is to link all the agencies in the DOE complex into a single satellite/computer communications system with secure data channels. The system will eventually include digital video and digital voice capabilities as well.

Present communications within the DOE complex are by telephone lines. Severe overloads have been experienced in data exchange between computers in the often encrypted transmissions. Conference calls via FTS are often of poor quality. In light of the 50 percent annual increase in communication volume within the complex, the new system offers capacity for anticipated growth and significant improvement in quality.

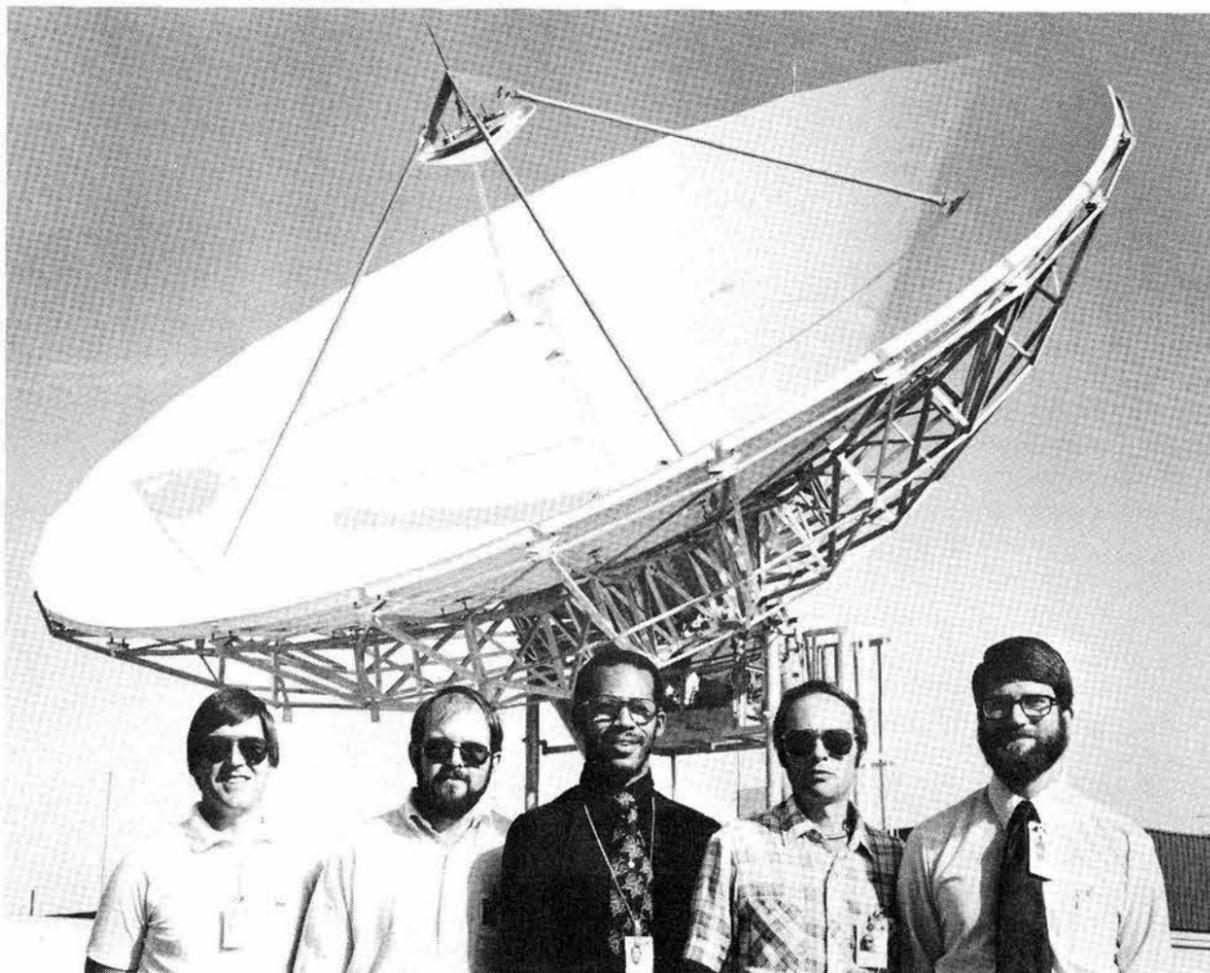
Because Sandia Albuquerque is slated to be the first "node" connected to DOE Germantown on this system, Sandia has had to become heavily involved in the engineering and implementation of the system. Sandia, as a kind of pioneer in this effort, will be instrumental in establishing some of the frontiers in this new type of system. The system is called OPMODEL, short for "Operational Model," because DOE considers it experimental and developmental at present. Eventually though, the communications system will be used in daily operations. The Sandia effort is being carried out by Communications Engineering and Services Division 2615 under Bob Trudo and Computer Communications Design Division 2648 under Don Schroeder.

"The first phase of the project," Bob says, "is to establish secure satellite communications channels between Albuquerque, Germantown, Kansas City, and Livermore. We're looking at a data exchange rate of up to 1.5 million bits per second." Target date for testing the first two nodes of the system is Oct. 1. Operational links between Albuquerque, Kansas City, and Livermore are planned by August '84.

The antenna near Bldg. 880 is focused on one of the WESTAR geosynchronous satellites, operated by Western Union, that remains in a "fixed position" — its orbit and velocity are synchronized with the earth so that the satellite appears stationary in the sky at approximately 22,000 miles altitude.

"Satellite communications," Don says, "have a number of inherent problems that will have to be solved. One of the biggest is time delay — one-quarter second each way — between transmission and receipt of the data. If you're sending 1.5 million bits per second, that delay involves a lot of data. The time delay interacts in complex ways with computer communications protocols to reduce throughput efficiency. Techniques must be developed to improve throughput of these communications protocols over satellite links.

"Securing the data by encryption over a



A NEW ANTENNA, 11 meters in diameter, near the southeast corner of the Computer Annex is focused on a WESTAR satellite — heart of a new computer/satellite (including voice and video) communications system for the DOE weapons complex. Sandia will plan and implement the first system links with guidance from an inter-agency technical working group. Sandia team members responsible for the project are Mark Wilkins (2615), Blaine Burnham (2612), Ivory Alexander (2615), Spencer Nelson (2648), and Lyndon Pierson (2648), project leader. Site coordinator is Jim Porter (2615).

satellite link is also a problem" he continues. "Encrypted data have to be very carefully synchronized with decryption equipment, and the long transmission time delays can cause problems."

"Timing control will have to be altered," Bob adds. "Sandia computers now communicate using a master-slave clock system. With the satellite system, all digital communications at Sandia — and eventually within the entire weapons complex — will communicate in step with a master clock associated with the satellite."

Divisions 2615 and 2648 are dealing with these and other engineering hardware and software problems in conjunction with a DOE Technical Operations Group (DETOG) organized by DOE Headquarters and including many of the DOE agencies, contractors, and organizations. Since Sandia and Germantown are scheduled to be the first operational nodes, the DETOG is depending on Sandia for initial answers to many of the detailed technical problems.

"The hardware problems are complex and demand some new research and clever solutions," Bob says, "but the software problem appears to be a nightmare. Historically, each member of the weapons complex bought computers and developed programs to fill a specific need and do a specific job. Needless to say, the programs and computer languages used for these computers are neither interchangeable nor compatible. DOE's long-range plan to have the agency computers communicate over the new system is a monumental — and expensive — task."

However, Don points out, the system has

the potential for providing services and efficiencies not possible now — for instance, a total CAD/CAM data interchange between design computers and production computers as well as instant integration of changes in design, production, procurement, or scheduling within the complex.



Here are some current volunteer opportunities. If you are interested, call Karen Shane (4-3268).

**EDGEWOOD SENIOR CITIZENS** has requested administrative help in obtaining a meeting center for which the state has committed \$25,000.

**PARENTCRAFT**, a center for parents of infants and toddlers, needs a variety of volunteers: newsletter editor; "warmline" counselors to talk by phone with parents of young children about non-medical, non-crisis child-rearing concerns; and individuals or couples to facilitate small groups of first-time parents through an information curriculum.

## Emergency Planning, Energy Security, Nuclear Waste

Emergencies that disrupt the normal patterns of life come in many forms — floods, hurricanes, blizzards are a few that nature inflicts upon us with some regularity. Manmade crises range from terrorist bombings to war — both conventional and nuclear.

Under any emergency situation, the continuity of local and national government must be assured. To explain what is being done in this area, Admiral Atley Peterson (USN, ret.) recently presented a colloquium entitled "Preparedness Management." He emphasized President Reagan's determination to rebuild the National Defense Executive Reserve (NDER) and described the overall responsibilities of the Federal Emergency Management Agency (FEMA).

"FEMA reports directly to the President and is the successor to many different agencies," said Peterson. "It was organized in 1979 to pull the entire federal government into action. When the U.S. received hundreds of thousands of Vietnamese boat people, FEMA was the agency that found food and shelter for them."

Petersen emphasized that FEMA's prime objective is to keep the essential functions of government working or to restore them quickly. He described the regional FEMA centers that would be immediately activated in the event of an emergency.

"FEMA is one of the few government agencies that received a big budget increase," said Petersen. "In an emergency, FEMA would grow from its present 2,500 to 18,000 people through NDER. But NDER, which includes experts in many fields from both private firms and government, has its problems. We don't know whether the reservists would report."

"We do have a plan to meet a national emergency, but it's spotty, not good. True, it has improved every year, but it's hampered by the politicians' unwillingness to bite the bullet. They don't vote money for nuclear defense because the nuclear freeze movement is having an effect on their constituencies."

Speaking two days after the June 20 demonstrations, Petersen said the nuclear freeze people are fighting preparedness. "I see preparedness as an opportunity to develop another deterrent."

\* \* \*

Between the world wars, the French constructed the Maginot Line — a series of fortifications on their eastern frontier. The "impregnable" defensive system did little to slow down Hitler's Panzers (mainly because it was in the wrong place), and "Maginot Line" has come to mean defenses that give a false sense of security.

In a talk entitled "Energy Security: Re-inventing The Maginot Line," Amory Lovins mentioned that only a tenth of America's energy comes from oil imported from the "unreliable" Middle East. His point was that the other nine-tenths is at least as insecure.

"Ninety percent of our domestic oil sources can be cut off as easily as Mideast oil," warned Lovins. "Our government has

behind it decades of dedicated inattention toward energy security. While we worry about defending ourselves against a thousand missiles, we've designed an energy supply and distribution system that's enormously complex and centralized — and would take 10 years to rebuild.

"Small groups of terrorists can easily black out a city, a region, maybe even the whole country."

The Pentagon's civil defense arm and DOE's Energy Research Advisory Board commissioned Amory and Hunter Lovins to conduct a study of America's energy vulnerability. Out of this study, they developed a book: *Brittle Power: Energy Strategy for National Security* (Andover, Mass.: Brick House Publishing Co., 1982).

Lovins demonstrated that our energy distribution system is inflexible and interdependent. The nation's energy supply depends on electric and natural gas grids; it uses hazardous fuels that are transported through population centers every day. Pumping and compressor stations are vulnerable. The system is easy to disrupt. "If we had set out to design a system this vulnerable, it would have been hard to come up with something better than we've got."

The threat is greater than that of nuclear attack, said Lovins. And he finds disturbing the pattern of attacks on energy sources in the U.S. and throughout the world. "The designs of nuclear energy systems are such that a handful of people can cause widespread damage," he said. "This vulnerability alters the power balance between large and small groups in society, and there's no effective defense, especially on the part of a free society."

Energy decentralization can effectively counter this threat, Lovins believes. It is being pursued in China and Britain; the Soviet military urges decentralization, but the Communist Party resists it, fearing a loss of its power.

"We must adopt the strategy of the tree," he said. "The tree has many leaves and each leaf has many veins. If any one leaf is attacked by insects, the others carry on the vital life functions and the tree survives."

Lovins would combine decentralization of energy facilities with the efforts of individual communities to achieve energy independence. Add to this some conservation and develop some fine-grain, independent units in our distribution and communications grid and our nation would be much more secure.

"Sure, military security is important," said Lovins, "but we overlook the very real possibility of the country being crippled by a handful of terrorists. By adopting design principles drawn from biology and engineering, we can make our energy supply so resilient that major failures become impossible. Such a system would be more efficient, diverse, dispersed, and renewable."

\* \* \*

Characterizing his talk to Sandians on nuclear waste disposal as being akin to carrying beer to Munich, Robert Pohl of Cornell University presented a colloquium

entitled "Nuclear Waste Disposal: Can We Defuse the Hot Issue?"

Pohl pointed out that in the past 10 years, "an enormous effort" has been devoted to the issue of high-level nuclear waste. The debate rages unabated as to whether nuclear waste can be isolated from the environment. As to which side is right, Pohl asserted that the answer will come "with certainty 1000 or 10,000 years from now."

The issue, according to Pohl, is how the scientific community can create enough public confidence to support scientists' efforts to find safe ways of storing nuclear waste. "Models are capable of proving almost anything," he said. "We have to demonstrate through actual facts that we can do what we've promised to do."

"It is more difficult to do this for high-level waste, but far too little has been done to demonstrate to the public that we can indeed safely dispose of even low-level nuclear waste. If we can accomplish this, then the 'hot issue' of high-level nuclear waste can be defused."

Pohl described the problems associated with three kinds of low-level waste: transuranic wastes, uranium mill tailings, and contaminated metals.

"Transuranic wastes are very long lived — plutonium 239 has a half life of 20,000 years," said Pohl, "and we have 350,000 cubic meters of the stuff. Transuranic waste is being produced at the rate of 30 cubic meters a day."

"About 250,000 tons of rock have to be mined to extract 240 tons of uranium. The rest goes into mill tailing piles, which contain an abundance of radioactive elements such as U-234 and thorium 230. Of the 100 million cubic meters of mill tailings in the U.S., about half is in New Mexico. Sand containing radioactive mill tailings was given freely for the building of homes. Amazingly little has been done about the health hazards inherent in this situation. The dangers have been discussed only in a limited fashion — the public wants to know the immediate dangers, if any, especially about contaminating ground water or inhaling radon gas."

Contaminated metals come from enrichment plants and include nickel, copper, and steel. They are classified and stored in warehouses because they are too contaminated to melt down. Pohl said nothing is being done about the problem.

In conclusion, Pohl stated: "It's very important that we turn our attention to these 'minor' issues of nuclear waste disposal. I wish many other labs and industries would follow Sandia's lead by working on problems that can be solved — or, at least, lessened — and thereby increase public confidence."



Brazil is increasingly concerned about its \$88-billion debt, but author Luis Fernando Verissimo, in the newsmagazine *Veja* of São Paulo, offers a solution: Magnanimously "return Brazil to its rightful owners, the Indians" — and leave them with the debt. "I would gladly pay my part of the bill — \$1,370 — to give the nation a clean slate and inaugurate a new era of fiscal realism," he says, "but it is above my monthly credit card limit."

— World Press Review

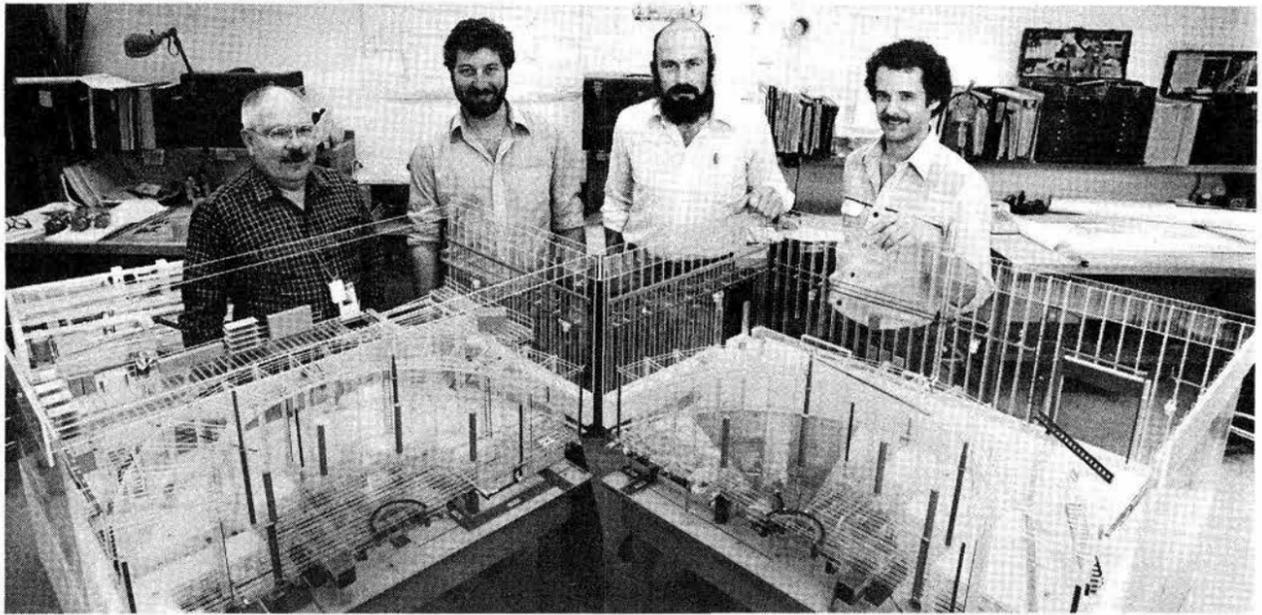
## PBFA-II Model

the drawings were discovered that, had they been cast in concrete, would have been extremely difficult, expensive, and time consuming to correct.

"It is the actual seeing of the design in three dimensions — the physical reality of the concept — that is most valuable," says Duane Burgeson (1251), project leader of the PBFA-II model building project. The work is done by Craig Larson and Don Gillmore of New Mexico Engineering Research Institute. Both are professional engineering model builders.

"Drawings are flat in two dimensions," Duane continues. "As many as 300 drawings might be needed to define an area. Even to a trained professional — physicist, engineer, draftsman, plumber, electrician, or carpenter — this mass of complex information is not easily visualized in three dimensions. The model helps everyone see and understand the same thing. The model becomes a design tool with everyone contributing. Conflicts in design can be eliminated. For example, conduits for electrical cables can be rerouted if they interfere with other equipment operation. These things can be quickly spotted on a model and fixed before actual construction begins.

"Computer drawings with a 3-D perspective could be generated — if you had the programming resources and computer capacity available — but they would still be only drawings on a two-dimensional plane from one viewpoint. The beauty of a model is that you can walk all the way around it and see everything from every angle — an infinite number of snapshots with your eye. It's a permanent physical display requiring no high-technology people to manipulate a computer console to create a view."



MODEL BUILDERS Duane Burgeson (1251), Craig Larson, Don Gillmore, and Grant Edwards (all NMERI) display scale model of PBFA-II. The tables swing together to join the two halves. Basic material of the model is plexiglass with different colors defining different systems. Each component is precision crafted to the scale of 3/8-inch to the foot.

PBFA-II will be a unique machine carrying the hopes of the Pulsed Power Sciences Directorate 1200 to be the first to achieve "net gain" fusion — a fusion reaction that produces more energy than has been expended to initiate it.

PBFA-II will produce 100 trillion watts of power and 3.5 megajoules of energy in a pulse lasting only 35 billionths of a second. The output of this pulse will be several times greater than the instantaneous output of all power plants on earth.

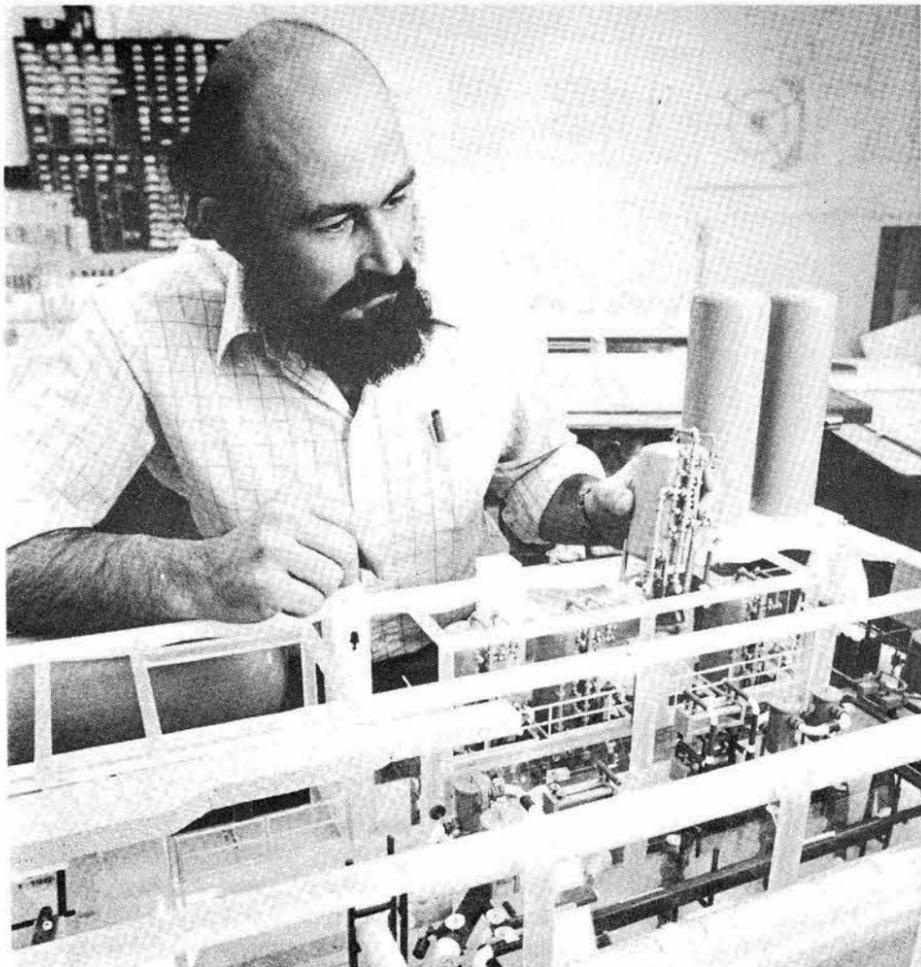
The design of PBFA-II is not finished. Experiments with PBFA-I, which has been operating since 1980, are being analyzed, and the results are contributing to the design of PBFA-II. And, when completed in 1986 at a cost of \$48 million, the completed PBFA-II facility will be marked by flexibility.

The giant accelerator will consist of four layers of nine modules each, arranged in circles like the spokes of a 108-foot-diameter wheel. The modules — each consisting of a series of capacitors, switches, and transmission lines submerged in oil and

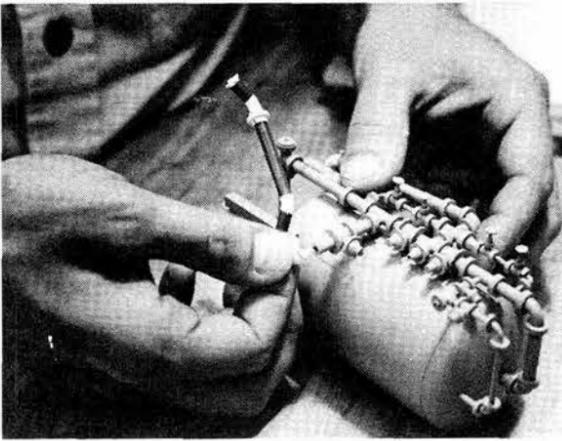
water in separate sections of a 20-foot-tall tank — will converge on a central hub, which is the vacuum chamber where a tiny deuterium and tritium fuel pellet will be imploded. Electric current will be passed through each of the 36 modules simultaneously, each line producing about four million watts and 690,000 amps.

The flexibility comes in because the modules will be configured so they can be added in parallel or series combinations to provide voltages ranging from two to more than 16 million volts. This will allow a choice of ions that can be accelerated.

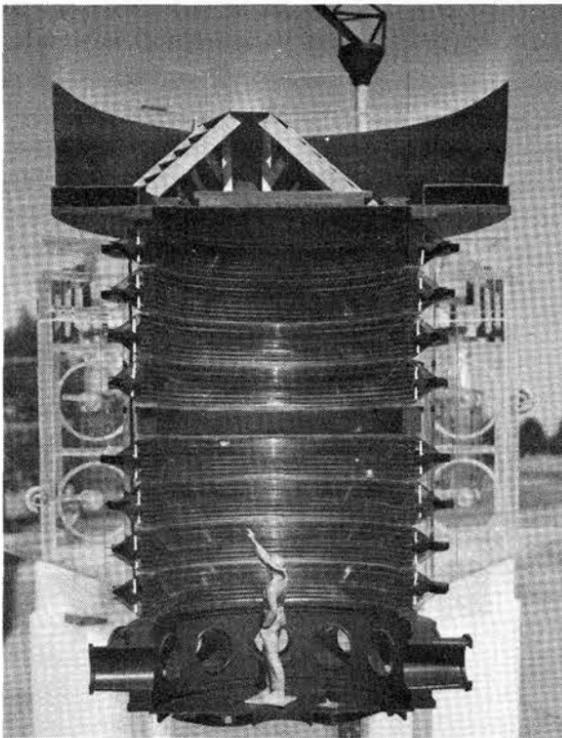
There are considerations in the design that can only be explored in three dimensions. The massive components of the accelerator will have to be moved. Hoists and cranes will be needed. People must have access to all the myriad parts of the machine. There are critical optical paths for a laser triggering scheme. Cables and electrical connections in the tens of thousands must have organization. The vacuum system and the 610,000 gallons of deionized water and 600,000 gallons of transformer oil require storage tanks, pumps, and piping. The



MINIATURE TECHNICIANS operate a model of one power module of PBFA-II. At right is a cut-away model of the central vacuum chamber of the fusion machine. Eventually, all energy-generating and ion-producing modules will direct their beams into the full-sized version of this central chamber to implode a tiny pellet of deuterium and tritium. In photo at left Don Gillmore installs completed model tank and piping into the larger model. Some model systems of PBFA-II are glued into place, but other components and systems are removable to facilitate design changes.



PIPING AND FITTINGS are installed on a model of a deionized water storage tank. Many standard components such as valves, joints, and piping are available to model builders from commercial sources. Unique components are crafted from plexiglass or balsa wood from drawings. Engineering scale models are marked by precision.



CUTAWAY MODEL of a vacuum chamber helped Purchasing solicit bids for fabrication of the device. Models serve as communication tools by making the design intent clear.

machine and its support facilities are mind-boggling.

A model is the answer.

The model has led to proper positioning of catwalks, hoist arrangements, people access, and support facilities. It has permitted engineering flexibility and consideration of alternate scientific proposals during construction. The model has contributed to the proper sequence of equipment installation as well as the method and path of entry. Dimensions of a large door were changed to give an overhead crane more clearance.

Miniature model workmen, in scale to represent a six-foot human, are moved along the pathways and around the equipment into all areas requiring people in PBFA-II. This procedure has resulted in design changes to provide easier access and greater safety.

"All of these things add up," Duane says. "Every day brings more justification for the model project. I can see a time when all large engineering projects will be built this way. The petrochemical industries and shipbuilders are using models now. In some cases the models are the drawings. For PBFA-II, the models have been invaluable. Sandia is fortunate to have Craig Larson and Don Gillmore on the job."

*Q. As one of the many Sandians who use the services of Medical for administering allergy shots, I certainly appreciate the time and cost savings this provides. However, with the drift of the center of population to the south, I would like to suggest that Medical consider establishing a satellite office for such injections in the southeast part of the tech area. Such an office could be staffed by a nurse-practitioner for perhaps a half day every week or two.*

*A. The suggestion is worthwhile. Unfortunately, our manpower situation at this time does not permit fragmenting our operation.*

*We hope in the future to have a new medical building that would be more central to the Tech Area.*

*P.B. Mossman - 3300*

*Q. With the demise of the parking area south of Bldgs. 821-23 to begin construction of the new Technology Transfer Center, the supervisors of people working in Bldgs. 892, 893 and 894 and the small buildings west of them need some help in convincing people that Sandia really is concerned that its employees should have parking within a reasonable distance from their place of work. Consider what has happened.*

*The building of 821-23 moved a convenient area a block south of 892 another block away. When people moved into the new buildings, the competition for spaces effectively moved parking another block or two further away. Supervisors talked about how good walking was.*

*People who tried the lot north of 880 were affected when half of that area was absorbed for construction. To park north of 880*

*now means near the water tower unless you come at 7:30. It won't get better when construction is completed because of the people in the new buildings. Supervisors talked about how good car pools are.*

*Now the latest step in the sequence means that the closest parking is five or more blocks away.*

*Please announce that moving sidewalks, buses, trains, or close in areas for new parking are in the grand plan for the near future; I don't think anyone will accept the idea that five blocks is a reasonable distance to have to walk to work.*

*A. The Grand Plan does not include moving sidewalks, buses or trains, and the distances to parking lots will increase for some people — especially those near the center of the Tech Area. New construction has changed parking patterns, and we have been concerned about distances. Most folks have felt it best to locate the buildings close together because many trips are made between buildings while only two trips are made to and from the parking lots. The need for most buildings to be inside the Tech Area has made it impractical to provide close-in parking.*

*It would take a tremendous fleet of buses to transport people from the parking lots into the Tech Area since 70-80 percent of our employees arrive in the last 10-15 minutes before 8, and it would surely take 15 minutes for the buses to make a round trip. At 4:30 p.m. the situation would be even worse.*

*I'm pleased that supervisors have talked about the benefits of walking and car pools, because it appears that the distances to parking lots will increase in the future.*

*R.W. Hunnicutt - 3600*



RUSTY GILLEN (3435) captains his crew of hearties (members of The Guzz softball team) to victory for the second year in a row in the Great Race down the Rio Grande. Sponsored by the Albuquerque Parks and Recreation Department, the 7.8-mile race goes from North Beach to Corrales Bridge. The team set a record — 80 minutes — this year. That's Rusty steering from the stern of the raft. Naturally and traditionally, the team tossed the captain into the drink after the victory.

## Take Note

The American Institute of Chemical Engineering is soliciting papers for its spring 1984 national meeting on "Rate Processes in Oil Shale and Tar Sand Operations." The call is for papers in both the applied and fundamental aspects of rate processes. Appropriate papers would deal with the rates of transport processes or the rates of chemical change during any phase of oil shale or tar sands processing. Interested authors should send titles and abstracts to William J. Thomson, Dept. of Chemical Engineering, Washington State University, Pullman, Washington 99164. The meeting will be in Anaheim, Calif., on May 20-24, 1984.

\* \* \*

A "Somos Bilingües Special" with Julia Gabaldon (3163) will air on Spanish radio KABQ on July 16 from 8 a.m. to 10 a.m. The talent search for the New Mexico State Fair Hispanic Heritage Day program will be the topic of the program.

\* \* \*

During July and August, KAFB's Morale, Welfare and Recreation Division will present free midweek entertainment at the Parade Ground. The programs are on Wednesdays from 11:30 a.m. to 1 p.m. Bring a sack lunch or take advantage of the snack trailer for purchasing hot dogs, beverages, etc. Families and kids are also welcome to come sit on the grass and enjoy the following events:

July 13 — Mariachi music with Pepe Alvarez; Demonstration: Porcelain Doll Making; "Close Up" Magic

July 20 — Zuni Pueblo Indian Dancers; Demonstration: Ceramic Mould Pouring; Puppeteering

July 27 — "Sharman" & The Golden Country Band; Demonstration: Jewelry Making

\* \* \*

A slide show and lecture on the natural history of the United States and Mexican borderlands will be presented by Frederick Gehlbach, author of *Mountain Islands and Desert Seas*, on Monday, July 11 at 8 p.m. at the KiMo Theatre. Admission is by donation, with all proceeds going to the New Mexico Museum of Natural History Building Fund.

The slide show precedes a July 12-15 tour of the Black Range and Pinos Altos of New Mexico and the Chiricahua Mountains of eastern Arizona. The trip will include field sessions on mammals, birds, fish, and vegetation of both areas, as well as night drives to study owls, reptiles, and other nocturnal animals. The trip size is limited and, although it may be filled, call the Museum Foundation office, 841-8838, or Jeff Gottfried, curator of education, 841-8840, now to check possible cancellations or for more information about either the slide presentation or the trip.

\* \* \*

A call for papers is announced for the 1st Symposium on Space Nuclear Power Systems to be held Jan. 10-13, 1984. Summaries must be received by Aug. 15 for consideration. Authors of papers selected for publication at the symposium will be notified by Sept. 1. The symposium will be held at the Four Seasons Motor Inn in Albuquerque.

For further information, call Carlota Klimas at 6-0215.

\* \* \*

Mary Jane Hicks (1627) made a presentation at the 33rd annual Society of Women Engineers national convention in Seattle on June 22-26. In her presentation, "Super-Safe Systems: The Design Challenge," she discussed Sandia's responsibility for ensuring the safety, security and reliability of the nation's nuclear ordnance. Weapons command, control, and safety systems — from those on individual devices up to those serving whole facilities — must function with very high reliability; at the same time they must protect their domain from hazards, which can be either natural accidents or adversary incidents. The goal of the Exploratory Systems Development division is to marry these system objectives with state-of-the-art technology to produce proof-of-principle hardware.



FATHER-AND-SON team is the first in Sandia's Summer University Faculty Program. At right is Bennett Basore (311), head of general engineering at Oklahoma State University in Stillwater; Paul Basore (9724) is assistant professor of electrical engineering at Iowa State University. The program brings faculty members to Sandia during the summer to familiarize them with Labs' programs in their particular areas of expertise and benefit from their ideas and contributions. Currently the program has about 70 members who are full-fledged temporary employees. "This is my first time with the program," says Bennett, "and Paul's second." Paul was born in Albuquerque when Bennett was a Sandia employee from 1952 to 1957.

### Congratulations

Floyd and Debbie Spencer (both 7254), a daughter, Melissa Beth, June 21.

Bill Kolb (3631) and Irene Hepner (2455) married in Albuquerque, June 25.

Laurence (334) and Jane Phillips, a daughter, Erin Amanda, June 8.



WIFE AND BLANKET were much appreciated after David finished his run. It netted over \$1500 for Aaron's medical expenses.

### 40-Mile Run Benefits Child

David Williams (2511) put his formidable running skills to good use last month. His 40-mile run from Sandia Heights to Los Lunas netted over \$1500 in pledges earmarked for the medical expenses incurred by Aaron Garcia, infant son of Irene (2314), who was born with spina bifida.

David began his run — a mile for each of his 40 years — at 1:30 a.m. on June 26 and finished just under seven hours later. After a shower, a nap, and some TLC from wife Cecelia (not necessarily in that order), David was as good as new — but not discussing any repeat performances.

Congrats, David! And congratulations to those who pledged money to help young Aaron. (Contributions are, of course, still welcome. Contact Betty Voss on 4-7346 or Jenny Otero on 4-4374.)



"A ROSE IS A ROSE" is the title of an original color slide by Odessa West (3155). It took first place in the slide competition at the recent 24th Annual Industrial Photographers of the Southwest conference in Santa Fe. Here she holds a print made from the slide.

## Fun & Games

**Baseball** — Come out and root, root, root for the home team on July 29. Sandians, spouses, dependents, and hangers-on have been invited to join Base people for Kirtland Night with the Albuquerque Dukes. Box seat tickets are \$2 (regularly \$3); they're available at the Que Pasa Rec Center (north of the hospital on B Street, KAFB-East); free buses leave the Main Exchange at 6:15; game's at 7. Oh yes, the Dukes' opponents are the Hawaii Islanders.

\* \* \*

**Golf** — Linda Branstetter (1521) made it to the semi-finals in the recent Women's Open in Hawaii. The tournament, the U.S. Women's Amateur Public Links Championship sponsored by the U.S. Golf Association, is a national tournament with regional matches played throughout the country. Linda won the regional in Albuquerque to qualify as one of the 120 finalists. She played seven windy days in Honolulu before losing in the semi-finals match. A college champion (LAB NEWS, Aug. 21, 1981), Linda's competition was primarily college women. "I felt older," Linda says. "I hadn't played 36 holes a day for a couple of years. It was tiring."

\* \* \*

**Running** — "One of the best organized runs I've been in," reports Kathie Hiebert (315). She was describing the recent Sperry-United Way Fun Run, but she may be biased — she won the drawing for the grand prize, a trip for two to anywhere TWA flies. She and husband Henry Dodd (9752) will travel to Norway next winter for some X-C skiing. Another Sandia winner was Henry's running mate, Terry Bisbee (2615), who won a programmable H-P calculator. The event attracted more than 650 runners/walkers and enriched the United Way coffers by more than \$3000. Thanks, Sperry, for the chance to run for a worthy cause — and enjoy it.

\* \* \*

**Biking** — For cyclists seeking a measure of control over seemingly unpredictable traffic lights, awareness of induction coil loops may help. Johnny Stuckey (3441), Sandia's bike safety coordinator, reports that Albuquerque's streets are implanted with about 1000 such devices. Located in the center of turn lanes, the loops are identifiable as epoxy-filled slots in the pavement. Alternating electrical current runs through wires below the pavement, generating a signal that, when disturbed by the metal in a vehicle, tells the traffic light control box to turn the light green or hold it on green longer. A cyclist's best chance of triggering the mechanism is to ride directly along one of the buried wires. But don't depend on its working — a bicycle may not have enough metal mass to trip the magnetic detector, in which case one may either have to rely on cars to do the job, get off and hit a pushbutton, or resort to techniques described in the June issue of *Bicycling* magazine, where this subject is discussed in detail.

\* \* \*

**Volleyball** — Paul Veer's team, Upper Uranus, won the A league tournament and the right to wear the coveted Sandia championship T-shirt. In the B league, Wendland Beezhold's team, the Zappers, dominated



TRAPSHOOTING CHAMPION Wanda Whitham (9400) demonstrates her winning style.

## Wanda Whitham Is Top Trapshooter

New champion trapshooter of New Mexico is Wanda Whitham, administrative assistant to 9400. Wanda took the handicap championship trophy recently by blasting 97 out of 100 flying clay targets out of the sky. She was competing against 140 of the state's top trapshooters, both men and women, at the Albuquerque Trap Club.

In the tournament, the shooters compete at several shooting stations, each with a constantly varying angle of target launch. The clay targets travel 60 mph and are

broken at a distance of 40 yards.

Wanda shoots a 12-gauge Browning trapgun which she cleans and cares for herself. She also loads her own shotgun shells. She's been competing in trapshooting tournaments for about 15 years and has collected numerous trophies. During the recent meet, she also won two women's trophies in the singles and handicap events.

"I love the competition," Wanda says. "But I'm not a hunter. I've never killed anything."

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the league and tournament play with a perfect season. Look in the LAB NEWS for information on the fall season, which will start in September.

\* \* \*

**Ski Club Emblem** — The Coronado Ski Club is sponsoring a contest to design a club logo for use on pins, patches, etc. The design should be relatively simple with four or fewer colors. A \$100 cash prize will be given to the person submitting the best design. Entries must be received by Sept. 1. For more info and contest rules, call Wes Pfarner (0321) on 4-7353 or 299-6521.

## Sympathy

To Bill Geck (3153) on the death of his mother in Albuquerque, June 29.

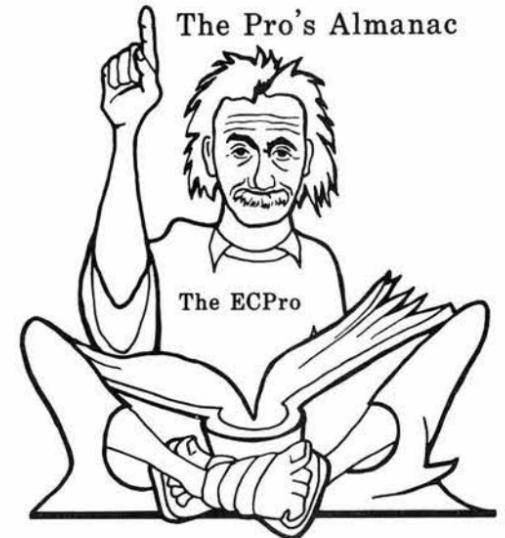


Brezhnev and Napoleon meet in the next world. "If we had had such a brilliant commander as you in the Soviet Union instead of Stalin," Brezhnev says to Napoleon, "then we would not have allowed Hitler to cross our threshold."

"And if I had newspapers like your *Pravda*," says Napoleon, "not a soul would have heard about Waterloo."

Collected by Zhanna Dolgoplova in  
*Russia Dies Laughing*

## Fiction And Fact From The Pro's Almanac



Dear ECPPro: How might a volunteer organization receive funding from the ECP?

— Bleeding Heart

Dear Heart:

[Forsooth, whosoever bleeds for mankind is like the person whose tears of compassion bathe the earth: they are returned a millionfold as lifegiving rain.]

Your organization's supporters may use Donor Option; for more information, contact the ECP Executive Secretary at 846-0348. If nothing else, you "might" get a heart-rending excuse. (Many thanks to John Zubersky [6451] for this question.)

# MILEPOSTS

## LAB NEWS

JULY 1983



Herminio Molina - 3618 20



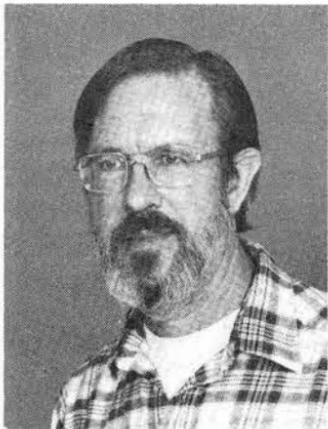
Jim King - 7400

BTL 30



Pat Lerma - 3612

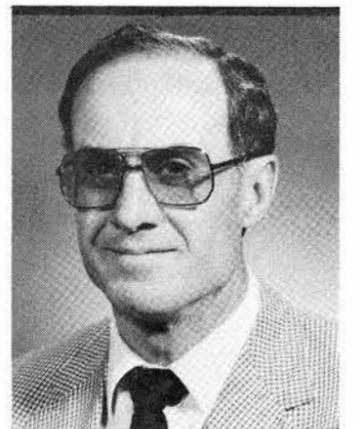
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Harold Short - 8331 25



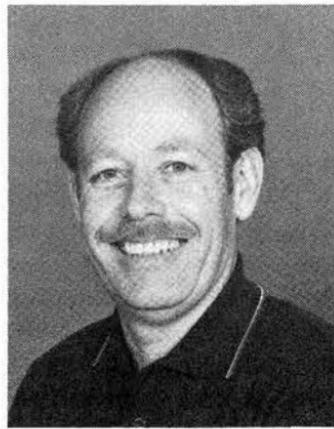
Bob Dougherty - 9316 25



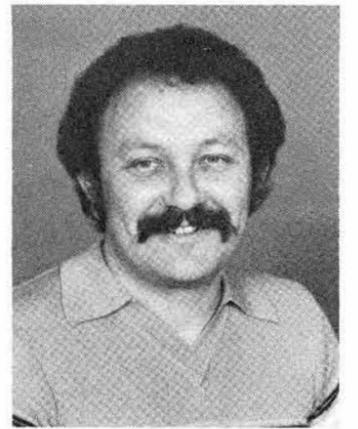
Fred Johnson - 3321 25



Ferd Thome - 8261 25



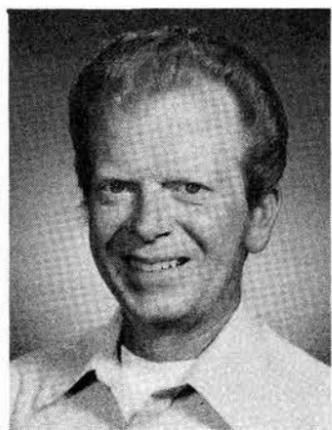
Lynn Zirkle - 8461 20



Danny Mitchell - 8163 15



Will Schmidt - 9444 25



Len Wilhelmi - 9216 25



Jack Hubner - 8264 25



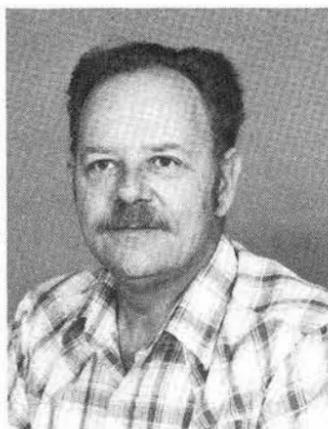
Gerry McCorkle - 7172

20

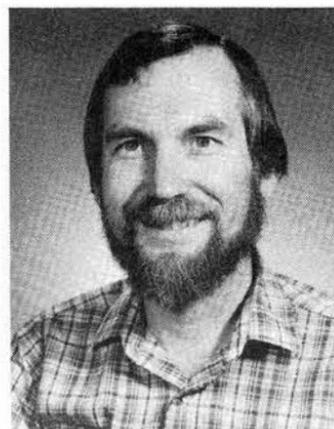


Homer Wilhelm - 3618

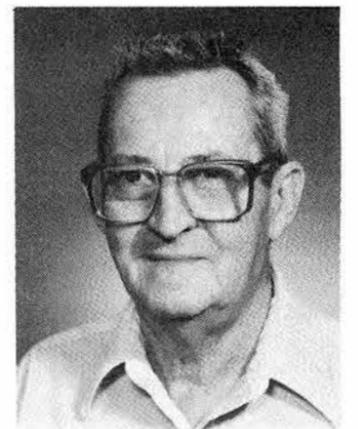
35



Jim Duggar - 8162 25



Charles Nidever - 7334 20



Dan Callahan - 3743 25



## Favorite Old Photo

In 1917 my dad was a truck driver hauling supplies to the National Guard under Brig. Gen. "Black Jack" Pershing. That group was under orders from President Wilson to pursue and capture Pancho Villa, the Mexican who had led a raid on Columbus, N.M., and killed 19 people in 1916. A part of the fleet operated by the supplier for whom Dad worked consisted of 33 1½-ton Packard trucks that carried provisions for the National Guard from the railhead at Marfa, Texas, to the Guard's outposts along the Mexican border. Dad is in the driver's seat as one of the new trucks is unloaded from a railroad car. — Merle Benson (2623)

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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 and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

### MISCELLANEOUS

- SANDIA T-shirts, all sizes, \$6; caps, \$6; buckles, \$8. S. Hwy. 14 Project. LAB NEWS, Bldg. 814.
- GARAGE sale — 5 families. Saturday, July 16, 7 a.m. to 3 p.m., 7309 Christy Ave. NE. Simons, 821-9343.
- GAS range, \$75; overhead shell w/jacks for long wide pickup, \$600. Molina, 299-8718.
- GREAT Dane, female, all shots, fawn, very gentle, spayed, ears cut, age 2, \$75. Menschel, 892-6475.
- FORD ¾-ton wheel, \$15, new fireplace damper, \$15; 12-speed bike, needs front rim, \$35. Bland, 265-6286.
- DOG HOUSE, large, newly renovated, \$65 or best offer. Vittitoe, 299-9298.
- FREE: 7 puppies, 8 weeks old, 50% Irish Setter, 50% Labrador. Greer, 836-1411.
- 21" B&W TV, \$25; wood TV cabinet w/folding doors, \$15; power mower, needs rings, \$20; trim mower, \$10; 7 x 7 umbrella tent, \$40; sleeping bag, \$30; cocktail table, \$30. Owens, 299-0113.
- 1955 through 1969 issues of LAB NEWS. Retiree Bill Ragsdale will mail them to anyone who will pay UPS shipping charges. 214/451-2311.
- TENNIS rackets, Kennex "Power Ace", 4% grip, just re-strung; Wilson "extra" 4½ grip, your choice \$30 w/covers. Roeschke, 298-0365.
- SCUBA Pro swim fins, size medium, \$15; fluorescent trouble light, \$10. Smith, 296-1908.
- WINFIELD china, passion flower pattern, 50 pieces, new and used, \$55. Zickert, 898-3475.
- UKC American Eskimo puppies, purple ribbon bred, 5 males, \$150 ea. or reasonable offer, Rimkus, 292-1258.

AIR conditioner, refrigerated, room size, window adapter, 5000 BTU, \$95. Stump, 344-9340.

FREE for digging, Japanese black pine, approx. 8 ft. tall, 8 ft. diam., conical shape; 1 photenia, 4 ft. tall. Rainhart, 821-3690.

FREE, will cut down uncomplicated trees. We take firewood, you keep branches/stump. No powerline or backyard problems. Shunny, 265-1620.

FIBERGLASS shell for LW PU, \$250; horses, AQHA stud, 3 yrs. old, 2 mares, gentle riding, one with filly, bred. Smith, 384-5182.

TOOLS: complete set of automotive tools w/tool box. Over \$1700 in tools, \$1300 or best offer. Duran, 867-3629.

GITAR, 6 string acoustical, \$25. Szepesi, 299-1847.

COUCH & CHAIR, vinyl, floral design, \$125; sleeper, \$75; liquor cabinet, \$35. Sanchez, 292-3852.

MAG wheels, 2 13" x 7" E-T aluminum mag wheels, hub covers & lug nuts, \$55. Boughton, 298-6576.

TWO COPIERS, w/supplies, Savin, \$400; SCM, \$100. Rea, 296-4620.

GREEN & White Wilson golf bag; wig carrying case; 2 dbl. bed ruffle (polished cotton), 1 white, 1 coral. Michele, 298-8576.

RADIATOR for '69-71 Chev. Caprice or Impala, AC radiator; emergency spare tire; shower enclosure. Marquez, 344-8455.

SWING SET: 2 swings, 2 gliders, slide, trapeze, \$35. Diegle, 294-5565.

CLOTHES washer, apt. size, needs some work, \$30. Klarer, 344-0612.

ANTIQUA treadle sewing machine, pre-1900, Wheeler & Wilson model D-9, \$75. Sherwood, 299-8146.

NORWEGIAN Elk Hound, male, 5 yrs. old, black and silver, nice temperament, has shots, free. Steele, 877-1225.

DRAFTING machine, Vemco V-track, left handed for 5' x 3' table, needs protractor which can be obtained locally, \$75. Davie, 296-3950.

LAWN mower, Toro self propelled, new battery, cost \$400 new, asking \$150. Sheaffer, 255-9473.

BLACK Angus bull, \$1000; cow and calf, \$550; beef calves, \$550; red wood egg incubator, \$350; metal incubator, \$50; four 30-foot wood trusses, \$40. Lackey, 898-6638.

TI99/4A computer w/cassette interface cable, software, and documentation, \$99 or best offer. Caffey, 296-3320.

GE L/O channel CB home base station, model 3-5869, AC/DC, new, never used, \$200. Larsen, 281-2454.

YORKSHIRE puppies, males & females, AKC reg., available about Aug. 1, make your selection now, \$450 ea. Hansen, 898-3173 or 299-4716.

RANCH oak bookcase headboard twin size bed w/springs, mattress, footboard, sheets, \$125. Nance, 296-8255.

OCTAGONAL coffee table, \$100; end table, \$45; girl's 19" bicycle, \$30; electric smoker, \$30. James, 294-6837.

ALUMINUM window, 3' x 4' sliding; steel sash windows, 3' x 4' & 18" x 3'; Misc. Zachewicz, 242-1396.

LARGE gold & white French Provincial mirror, apx. 4½' wide by 3' high, \$75. Pierce, 883-2719.

CIRCULAR game table, w/4 oak barrel chairs, \$175; recliner, \$100; U-haul boxes: small 50¢, medium 90¢. Roeske, 344-5659.

HAMMOND organ, Series 9200, book value \$650, will sell for \$500, includes bench and owner's manual. Stevens, 883-0480.

TOY poodle, gray, female, 3 yrs. old, \$75. Anderson, 298-0477.

YARD SALE: Sat. July 9th, 9-2, 9129 Hendrix Ave., NE (Montgomery/Moon), refrigerator, apt. size washer & dryer, cornets, toys, clothes, misc. Zutavern, 298-6523.

TWO ¼" round glass table tops, 42" diameter, \$20 ea.; Craftsman portable saw, \$35; exercycle, \$60; old trunk flat top, \$60. Jones, 296-7860.

LAWNMOWER, electric sunbeam, 3 HP, 2-blade rotary w/catcher, \$50. Fisher, 298-0526.

CAB-OVER camper, 8 foot, icebox, oven, \$650; white face steer, 600 lbs., \$400. Gorman, 898-9300.

CARPET, med-green sculptured nylon, 13'w x 20'l, w/½" pad. Replacement cost \$615, sell for \$150. Pavelko, 296-3346.

FOUR drawer, chest, \$25; hutch buffet, scalloped hutch top w/3 shelves, buffet has drawer, sliding doors, \$50. Allen, 296-6453.

FOUR tires, B.F. Goodrich radial mud terrains, 31x10.5 R-15, almost new, \$299. Moyer, 881-0754.

FOUR-family garage sale: camping equipment, fish tanks, kids' clothes, lots of misc. Today and tomorrow, 12404 Loyola Ave. NE. Carne, 296-4219.

POWER mower, needs spark plug, \$30; twin bed, \$35; assorted aluminum window screens. Mora, 821-6759, after 6 p.m.

### TRANSPORTATION

'76 FORD Courier, priced below NADA book. Shortencarier, 292-3575.

'82 BUICK Riviera, 5.7 litre diesel, all the extras, \$12,900 or best offer; '58 Chevy Belair, 6 cyl., \$3000 or best offer. Hykes, 256-0629.

'74 DATSUN 260Z, new paint, carpet, tires, high powered stereo, \$4500. Hansen, 266-6922, 898-3173, 299-4716.

'76 PINTO 2-dr., 4-cyl., 4-spd., canary yellow, AM/FM cassette stereo, 54k miles, \$2000. Christopher, 299-5712.

'73 DODGE Charger, 318 cu. engine; '69 VW Bug. Castillo, 836-0514 or 242-9601.

'70 OPEL GT, 25-30 mpg, rebuilt engine. Kent, 299-8821 after 5 p.m.

'69 MERCEDES Benz, 4-dr., blue, 230-regular gas, AC, AM/FM tape-deck, \$5000. Garcia, 298-8460.

'72 PORSCHE 911T Targa, new silver paint & electrical system, top end rebuilt engine, \$11,800 or best offer. Chapman, 296-4321.

'81 SUZUKI GS850G, Jammer, rack w/back rest, new Dunlop elites, \$2595. Curtis, 821-3522.

'79 YAMAHA 650 special, NADA avg. retail, \$1395, \$1200 or best offer. Mooney, 299-1774.

'73 MG Midget, 46,000 miles, new top and cover, \$2000. Simpson, 299-1895.

'71 1210 Travelall 4 x 4, 60K miles, trailer pkg., \$1100. Garin, 298-7963.

GIRLS 24", Schwinn bicycle, single speed, \$25. Luna, 884-5023.

'77 FORD Pinto, str. wgn., AT, AC, PS, PB, new tires, wire wheel covers, 46K miles, \$2500. Sandoval, 299-4154.

'75 MERCURY Marquis Brougham, PS, PB, PW, AC, cruise control, stereo AM/FM radio, 8-track, \$700. Pimentel, 268-0261 or 884-1669.

SEARS 10-speed European bike, \$40; boys 20" Schwinn stingray, \$40. Patrick, 265-4569.

'67 MUSTANG convertible, 8-cyl., PS, PB, PT, AT, blue, 81,200 miles, \$6000. Hodges, 822-0366 after 5 p.m.

'54 CHEVY 4-door sedan. Lujan, 299-4820 after 5 p.m.

'70 MONTE CARLO, 73K miles, \$1900. Valencia, 822-0465.

'73 VEGA, 2-dr. hatchback, 4-spd., 140 CID, AM/FM 8-track stereo, \$400. Murray, 821-1537.

'76 MUSTANG II, 4-spd., 4-cyl., AC. Irwin, 298-2049.

'74 MUSTANG II Hatchback, 4-cyl., 4-spd.; '70 Corvette T-top 350, 4-spd.; '74 BMW R90/6 motorcycle, fairing, trunk, Krauser bags. Brooks, 265-8612.

'81 HONDA Goldwing, loaded, 13K miles; cargo trailer. Brooks, 296-6870.

'76 MONTE CARLO, 50,000 miles, always garaged, new tires. McEwen, 821-1374 after 5 p.m.

RALEIGH Record Ace 10 speed, 21 in. frame, citadel lock, generator lights, \$150. Hubbard, 842-9431.

BICYCLES: lady's 3-spd., \$25; boy's, \$15; girl's \$35. Mora, 821-6759, after 6 p.m.

'76 OLDS, Starfire, V-6, 4-spd., PS, new engine and clutch. Tormey, 821-5142.

### WANTED

AIR conditioner, detachable type for automobile, either window mount or otherwise. Roeschke, 298-0365.

HOUSE to rent by Aug. 1, 2-3 bdr., w/garage, unfurnished, have own appliances, prefer NE area. Greer, 836-1411.

ROUND dining table w/4 or 6 low back upholstered swivel chairs, china cabinet, together or separate. Wherle, 255-4667.

EQUIPMENT for rock climbing, and backpacking, women's size 7 hiking boots. Shapnek, 281-5913.

SMALL game table with or without chairs. Jones, 296-7860.

GOOD home for 2 small dogs — poodle terrier cross and cocker cross, free. Lucero, 299-6300.

BICYCLE, child's 16" or smaller bicycle w/training wheels. Reineke, 898-2106.

### REAL ESTATE

3-BR, 1850 sq. ft., 3 car garages, lg. den, kitchen & utility room, screened back porch, ½ acre, Bosque Farms. Martin, 869-2049.

4 BR, 2½ bath, NE location, near Sandia bus, SW landscaping. At appraisal, \$143K. Horne, 884-7821, evenings.

'78 NASHUA mobile home, 14 x 70, 2 bdr., 2 bath, lg. LR & kitchen, refrig., gas range. Jones, 281-1186.

MOUNTAIN VALLEY property: 10-acres, wooded & pasture, surveyed, title insured, 25 min. east, \$28K firm. Silva, 255-3723.

FOREST Lakes Colorado: wooded recreation lot. Smith, 298-7365.

MOSSMAN w/pool, 1972 sq. ft., 3 bdr., den, wet bar, 2½ baths, \$84K. Ahr, 884-7292 or 881-3644.

'79 WAYSIDE mobile home, 14 x 70, 2-bdr., 2 baths, fp, wet bar, w/lot in Rio Rancho. Yost, 892-8962.

WOODED LOT, almost 1 acre, San Pedro Estates, recreational area, NM 112 near Cuba, N.M. Mora, 821-6759 after 6 p.m.

### WORK WANTED

PAINTING, by UNM student paintshop, inside, outside, estimates, references. Peter Shunny, 266-0266.

LAWN CARE — mowing, edging, trimming. David Day, 884-4203.

## Westwind Plays Tonight

TONIGHT at Happy Hour Westwind plays country and western for dancing. The special in the dining room is barbecued chicken for \$5.95. In addition, the Club's regular menu featuring fine steaks and seafood is available. Next week, July 15, Stomper holds the bandstand while barbecued beef ribs at \$6.95 is the menu special. Happy Hours start right after work with special prices in effect until 8:30 when the music starts. Dining room hours are from 6 until 8:30.

ON SUNDAY, July 17, the Club offers a special champagne brunch for \$5.95 for adults, \$3 for children 12 and under. The price includes a glass of champagne for adults. Additional bottles cost \$4. The menu features eggs, sausage, blueberry muffins, pastry, roast beef with mushroom gravy, baked chicken, Lyonnaise potatoes and assorted salads and desserts. For reservations, call 265-6791.

TUESDAY TWO-FOR-ONE dining continues through the month. On July 12, New York strip steak is the special at \$11.95 for two. The Arlen Asher Trio entertains. On July 19, Cornish game hens are the menu special at \$8.50 for two. The Happy Medium, piano and singer, plays the old songs.

THE BIG ONE comes Saturday, July 30, when the Club celebrates its thirty-third birthday. There'll be singing and dancing with Western Flyer, a cake cutting, and king crab legs or prime rib for \$12.95 for two. Call 265-6791 for reservations.

TRAVEL — The Club announces new trips to Durango, Las Vegas, Mazatlán, and New Orleans. In the meantime, deadlines to sign up are closing in for the China tour (Sept. 18-Oct. 7, \$2810) and Caribbean cruise (Oct. 28-Nov. 6, \$1095).

The Durango-Silverton trip to ride the narrow-gauge railroad during the fall foliage color change is scheduled Sept. 24-25 by charter bus with an overnight stay at the Strater Hotel in Durango. The tour includes snacks and refreshments on the bus, a visit to Aztec Ruins, a ride on the Alpine slide at Purgatory, and the train ride to Silverton and return to Durango. Cost is \$95 (double occupancy), \$92 (triple), and \$89 (quadruple). Children under 12 pay \$12 less.

Two options are available on the Las Vegas trip. Go by bus, stay three nights (Sept. 11-14) at the Maxim and pay \$124. Go by air (Sept. 11-13), spend two nights at the Maxim and pay \$146. Snacks are included on the bus; airport transfers are included on the plane.

Two options are also available for the Mazatlán trip. Go Oct. 31-Nov. 7 with Trans-Globe Travel (Chet Fornero, retired Sandian), and stay seven nights at the luxurious Playa Mazatlán Hotel (it's located right on the beach and sometimes called Coronado Club South). Included are round trip air fare on Western Airlines, transfers, Mexican and U.S. taxes, and a cocktail party one evening before departure with Chet as the host. Price is \$299.

The second trip departs via Western Airlines Nov. 7, returns Nov. 14. Academy Travel is the agency. Included are all of the above with the exception of the Mexican tax (about \$9). The party is scheduled on arrival — the Agency calls it a welcoming cocktail party. Price is \$297.

The New Orleans trip is scheduled May 25-29, 1984, during the time of the World's Fair. The package includes air fare, transfers, four nights at the Marriott Hotel located four blocks from the Fair entrance, two day's admission to the Fair, two breakfasts, a boat ride, and a dinner at the famous Andrew Jackson restaurant (wine included). Price is \$555, double occupancy.



SANDIA WAS HONORED recently during the state convention of the New Mexico Society of Professional Engineers with the 1983 Industrial Professional Development Award. The award recognized the Labs' "development and use of forward-looking employment practices in accordance with professional standards." Bill Snyder, director of Nuclear Fuel Cycle Programs 9400, accepted the award on behalf of Sandia and later was a member of a panel discussion on New Mexico economic development.

## Events Calendar

- July 8-10, 15-17 — Adobe Theatre, "The Night Thoreau Spent in Jail," 8:15 p.m., Corrales, 898-3323.
- July 8-31 — "You Can't Take It With You," Fri. & Sat. at 8 p.m. Sun. at 2:30 p.m., The Vortex, 247-8600.
- July 10 — Pow-Wow at Isleta Lakes & Recreation Area: Gourd dancing 9 a.m. - noon; Grand Entry at noon; food, arts & crafts, fishing, picnicking, camping. One mile off Broadway Exit on I-25 South, 877-0370, 873-1576.
- July 10-Aug. 15 — Santa Fe Chamber Music Festival, St. Francis Auditorium of the Museum of NM in Santa Fe:
  - Sunday Series Concerts: 6 p.m. (reserved seating)
  - Monday Series Concerts: 8 p.m. (reserved seating)
  - Thurs./Sat. Mozart Plus Recitals: 8 p.m. (unreserved seating)
  - Friday Baroque Series: 8 p.m. (unreserved seating)
 (Visit LAB NEWS to copy the program)
- July 14 — Santa Fe Desert Chorale, First United Methodist Church, 4th & Lead SW, 988-7505.
- July 15-16 — Puppeteer & Serenade Ballets; presented by Ballet Renaissance West, KiMo, 243-0591.
- July 15-17, 22-24 — Albuquerque Little Theatre, "The Sleeping Beauty" (a new version of this classic fairytale), Fri. at 8 p.m., Sat. at 2 & 6 p.m., Sun. at 2 p.m., 242-4750.
- July 15-17, 22-24, 29-31 — Albuquerque Civic Light Opera, "Grease," 8:15 p.m., 2:15 p.m. on Sun., Popejoy, 345-6577.
- July 16-17 — Northern Pueblos Arts & Crafts Show, San Ildefonso Pueblo, 852-4283.
- July 16-17 — "Spaceweek" exhibits sponsored by New Mexicans for Space Exploration. Sat. 10 a.m.-6 p.m.; Sun. 12-5 p.m., at Coronado Center.
- July 17 — Arts in the Parks, "Fiesta Day," 2:15 p.m., Old Town Plaza.
- July 17 — The NM Jazz Workshop, "All Blues Day," 2 p.m., Madrid Ballpark on North 14, food & refreshments available, dress for hot sun, 842-6659.



"My wife told me to sign up for your Volunteers Inaction Program — she says I'm as inactive as anyone."