

Varistor Lightning Safety Device Awarded Patent

A patent for an "overvoltage protector using varistor-initiated arc" — a safety device to prevent weapon system electronic components from being damaged by lightning strikes — was awarded to DOE recently. Inventor is John Brainard of Applied Technology Division 2562.

"Varistor materials are good insulators at low voltages and fair conductors at high voltages," John says, "but a varistor switch is inadequate for high current switching because it is destroyed at high currents. I use the switching properties of the varistor to initiate a gas discharge.

"By bridging electrodes with a varistor surface, making sure that there are point contacts between the varistor and electrodes and that the switching voltage of the varistor is sufficiently high, a surface flash-over occurs across the varistor at a precise voltage. The arc channel then moves away from the varistor preventing damage to the varistor surface."

The MC3550 lightning arrestor connector is an example. The connector uses gas-filled gaps, each containing tiny particles of varistor material. The varistor material is an electrical insulator at low electric fields, but becomes 10^7 times more conductive at fields above 1 kV/mm. If high voltage ap-

(Continued on Page Two)

Soviet Satellite Reentry

Sandia Plays Major Role in Predicting Impact Point

A major role in predicting the impact points of debris from the Soviet ocean surveillance satellite, Cosmos 1402, that fell to earth in two parts during the past several weeks was performed by a team of Sandia scientists in Aerodynamics Department 1630 under Randy Maydew.

The larger part of the satellite fell harmlessly into the Indian Ocean on Jan. 23. The second part, believed to contain much of the fuel for the nuclear-powered satellite, reentered the earth's atmosphere on Feb. 7 over the Atlantic Ocean between Brazil and Africa.

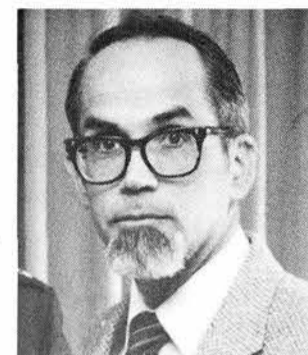
The reentry calculations — centered at Sandia — were conducted as part of the support provided by the Nuclear Emergency Search Team (NEST) Reentry Group, and involved inputs from Sandia Livermore, Los Alamos, and Lawrence Livermore National Laboratories; the Nevada Operations Office of the Department of Energy; and other organizations.

Before each part reentered the earth's atmosphere, computer-generated maps were prepared several times each day. These showed, with increasing accuracy, the satellite's expected point of reentry. The dates were immediately forwarded to the NEST search team leaders for planning purposes.

The maps also showed ground tracks for a few orbits before and after the predicted point of reentry. To prepare these maps showing ground tracks (the path on earth

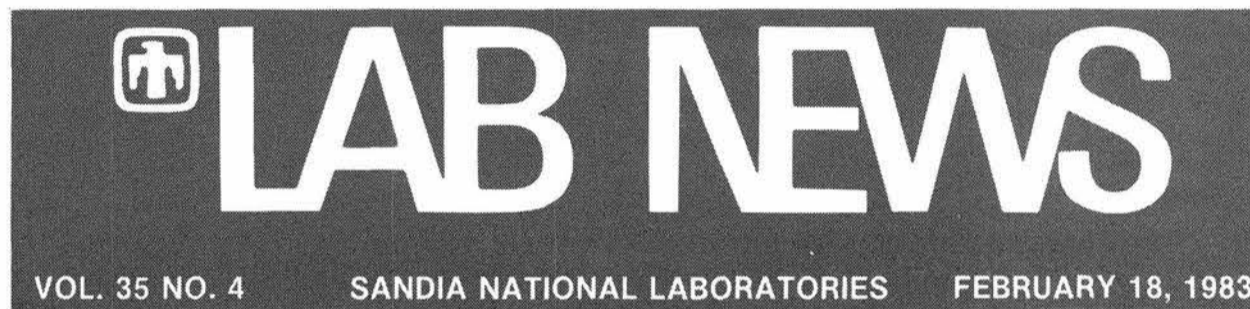


Stan Spray



Bob Graham

FOUR SANDIANS received Weapons Program Recognition Awards, presented recently by Maj. Gen. William Hoover, USAF, Director of Military Application. A joint award went to Tom Martin (1250; right) and Ken Prestwich (1240) for their pioneering work in developing a series of pulsed power devices that have led that field for nearly 15 years. An individual award went to Stan Spray (7232) for his contributions to nuclear weapon safety; he has generated a technological data base and conceived a new system design approach that achieves a vanishingly small risk of unwanted nuclear detonation. Another individual award was presented to Bob Graham (1131) for his contributions to the development of quartz and lithium niobate piezoelectric stress gauges for time-resolved measurements on shock-loaded matter. These gauges have been essential to Sandia's understanding of shock phenomena in the laboratory and at NTS.



overflowed by the satellite), Sandia received continuously updated USAF Space Command information about the satellite's orbit.

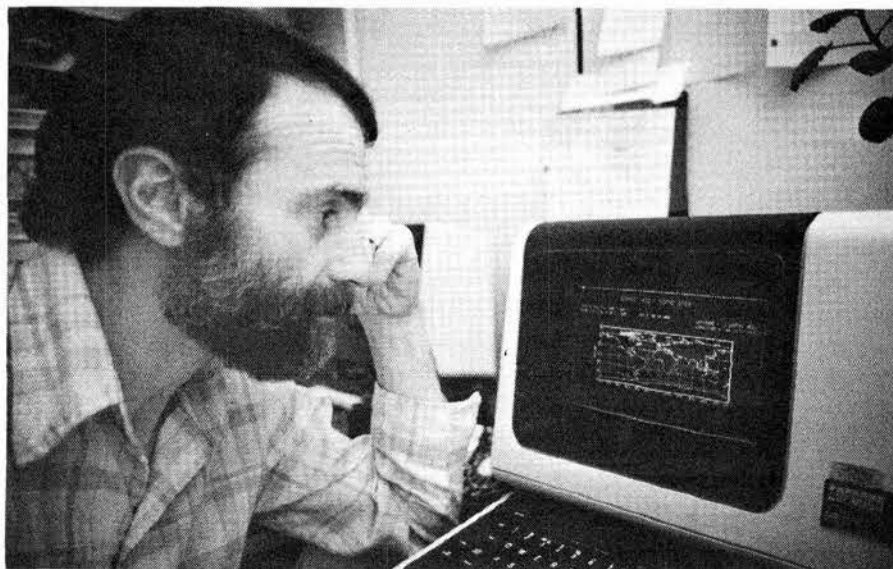
Ground track calculations, performed on Sandia computers, involved codes developed by both Space Command and Sandia. (When Space Command provided ground tracks for the two days prior to reentry of the satellite parts, the results showed good agreement with the Sandia tracks.)

Utilizing its expertise in reentry aerodynamics, Sandia also provided a prediction of the satellite's trajectory after it reentered the atmosphere. Trajectories also were calculated for the debris using a satellite break-up model. This was to define

a "debris footprint" that would have been needed if the satellite pieces had crashed on land.

The inputs for these calculations used information about the size, weight, and drag characteristics of the satellite and some of its components. Reentry aerodynamic heating and thermal analyses also helped define the times that satellite parts would probably break off from the main body.

Harold Spahr of Aerodynamics Simulation Division 1636 led the Sandia reentry computing team. Members were Larry Rollstin (1635), Bill Millard (1635), Fred Wyatt (1636), and Leonard Connell (1633), who performed the heat transfer and ablation calculations.



LARRY ROLLSTIN of Sandia's Aeroballistic Projects Division 1635 watches his computer terminal video screen display a world map. Using orbit information from the USAF Space Command, Sandia calculated ground tracks of the dying Soviet satellite, Cosmos 1402. Sandia also predicted the satellite's trajectory upon reentering the earth's atmosphere and the "footprint" that its debris probably would have left had it not fallen harmlessly into the ocean.

Antojitos

This is a flag-waving editorial, written by an avowed flag waver.

If you can hear "The Star Spangled Banner" or a rousing march like "Stars and Stripes Forever" and remain unmoved, you may as well quit reading now. But I hope you won't.

The new commander of Kirtland Air Force Base has reinstated an old policy. He has asked all of us who work on the Base--military and civilians alike--to show our respect for the flag.

Here's the problem. Some people, Sandians and military, are not observing the courtesies the commander has requested. The commander isn't asking for much, really. When we hear "To the Colors" at 6 a.m. or 5 p.m., we are to stop whatever we're doing, face the parade ground flag, stand at attention, and place our hats or right hands over our hearts. People who have spent time in the military may have to resist an impulse to salute. You're not going to get in trouble if you follow that impulse.

At the 5 p.m. Retreat, the ceremony we're more likely to observe, "To the Colors" will be followed by "The Star Spangled Banner." We're asked to stand at attention until the music ends. That's it.

Is it asking too much? In this a form of regimentation that should be considered repugnant? I don't think so. The few seconds these courtesies require will give us a time to reflect on how fortunate we are to live under that flag, and to think about all it stands for--a country that isn't perfect but is by far the best.

●Hank Willis

Base Asks Cooperation During Ceremonies

All Sandia employees are reminded of the Base's recently initiated reveille and retreat ceremonies, as announced in the Dec. 9 Weekly Bulletin.

Recently, Base security policemen stationed vehicle control points at each corner of the wing headquarters building (20200) to ensure that traffic stops safely in accordance with existing customs and courtesies.

Reveille is at 6 a.m. and retreat at 5 p.m. Anyone within hearing distance of the music should stop and render proper courtesies. Music will come from speakers on the roof of the headquarters buildings across from the parade ground.

Civilians outside should stop, face the flag or music, and place their hands (or hats) over their hearts.

Civilians in vehicles should stop the vehicle, turn off the motor, but remain inside and seated until the music is over.

In the morning, the traditional call "To The Colors" will be played as the flag is raised. In the evening, "To The Colors" will signal the start of retreat and will be followed by the National Anthem as the flag is lowered.

All military personnel on base will follow the same courtesies but will salute when outdoors in uniform.

Colloquium

Shuttle Imaging Radar Sees Below Surface

The shuttle imaging radar (SIR-A), which operated on the second Columbia flight in November 1981, is opening exciting new opportunities in global topographic mapping and spectroscopy instruments are providing new methods of identifying earth mineral deposits, reported Charles Elachi, senior research scientist with Cal Tech Jet Propulsion Laboratory, at a recent colloquium.

He presented an overview of the shuttle-based instrument operations and results.

The most impressive information from the imaging radar is new data revealing ancient watersheds in the sand-covered deserts of Chad and Sudan in Africa. The radar penetrated beneath the sand layer to depths of several meters to outline erosion in underlying rock formations. The information gives new insight into the climate and topology associated with million-year-old human artifacts recently found in the area.

The SIR-A also penetrated ice layers at the earth's poles, providing an indication of ice pack thickness. More than 10 million square meters of the earth's surface were mapped during the November '81 mission.

Scientific American published a summary article in the December 1982 issue on the capabilities of the radar imaging and other instruments aboard the shuttle.



"It's a lovely plane, I have every confidence in it," said Mr. Stephens. "Why the propeller fell off I just don't know."

— R. Bladen
(Manchester Evening News)
quoted in *Punch*

Continued from Page One

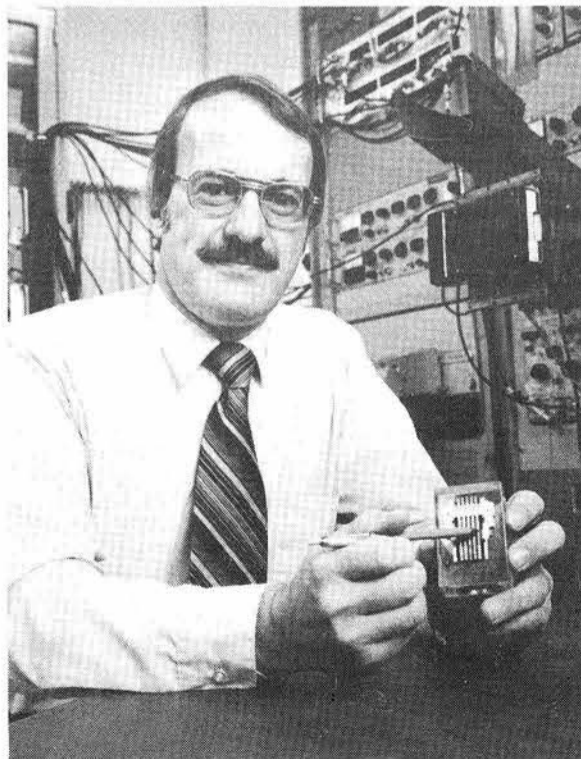
Lightning Safety Device Patented

pears at the connector pins, localized gas discharges occur at the contact points between the shell and the varistor particles bridging the connector pins. These discharges grow and coalesce into an arc across each gap, shunting the current to the connector shell. The varistor material is protected against excessive heating since the high-current arc occurs in the gas between the varistor particles.

Varistor-controlled lightning arrestor connectors are easy to make (compared with previously used field-enhanced gas-filled gaps), are very rugged, and have far more reproducible electrical arc break-

down characteristics than field-enhanced gaps. They will be used extensively in nuclear weapons to provide even greater reliability and safety against lightning strikes.

John credits Larry Andrews (2154), Keeth Treece (2115), Sharon White (8162), and Ken Moore (GEND) with important contributions in developing the initial varistor-controlled lightning arrestor connector.



INVENTOR John Brainard (2562) points out varistor material in a cutaway model of the MC3550 lightning arrestor connector. The varistor-controlled switching feature of the device was recently awarded a patent.

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More Than Just Another Heavy Foot

Drop a 475-horsepower, 350-cubic-inch 1970 Corvette engine into a 1955 Chevy and you get a dragster that can cover a quarter-mile track in just over 11 seconds and reach a speed of 120 mph from a dead start.

That's just what Jeff McQuown of Plant Maintenance Section 8257 has done to the Chevy he races regularly at the Sacramento Raceway.

The Manteca resident has been a car buff since he was a teenager, owning at least one or two '55s, '56s, and '57s over the years. He finally began competitive drag racing five years ago. Having a natural talent for automotive mechanics helps Jeff a great deal, since he spends 15 to 20 hours most weeks tinkering, tuning, and troubleshooting to get the car on the track one or two weekends a month.

Jeff runs in the ET (Elapsed Time) class, which is the hobbyist division of drag racing. "The more professional levels can cost thousands of dollars more than mine does so you have to have heavy sponsorship from business to keep your dragster in running condition. I do it just for the love of the sport and working on cars."

His father was a "street rod" buff in the 30s and 40s; his uncle used to do some racing and now deals in antique cars. Also, his wife Linda and 12-year-old son Kevin go along with him as boosters to the track. Jeff gave his 17-year-old son Bruce a '69 Mustang, but he isn't interested in dragsters — yet.

Converting a street car into a dragster involves some major modifications. Jeff installed a fiberglass front end, stripped the entire interior and replaced it with lightweight aluminum panels, cut away the trunk (including all the bulkheads), and added roll bars and other safety equipment. He has also installed plexiglass side windows, which are 40 percent lighter than the regular safety glass. The car has special rear axles and an automatic 400 GM transmission that has been completely modified inside to take the abuse.



DRIVEN ONLY on Sundays — but not to tea and not for sale. It's a '55 Chevy dragster owned and operated by Jeff McQuown (8257).

Jeff says that he is probably the only Sandian whose car runs on "gallons per mile instead of miles per gallon." His fuel is premium leaded gas that has been boosted to more than 105 octane rating.

He has been fortunate in getting a Manteca machine shop to donate work on the car: "You can break an incredible number of parts moving that much weight that fast.

"Races are lost in the blink of an eye. It

has become such a science that you have to become part of your machine, and your reaction time at the starting line has to be far less than half a second or you won't be in the running," Jeff explains.

So if you want to see some drag racing, head for Sacramento Raceway and watch for a pearlescent white '55 Chevy with some blue and purple paneling on the roof and trunk lid. Inside should be Jeff.



SANDIA LIVERMORE NEWS

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THREE LIVERMORE SANDIANS recently received the Award of Excellence for significant contributions to the nuclear weapons program from the Office of Military Application, DOE. Being congratulated by OMA director Major Gen. William W. Hoover (at left) are (left to right) Wil Jorgenson (8123), Dan Tichenor (8521) and Ken Henry (8444). They were recognized for their work on a holometry test technique for the W79 atomic artillery shell program. This is the second year of the OMA award and the first time it was presented at Sandia Livermore.

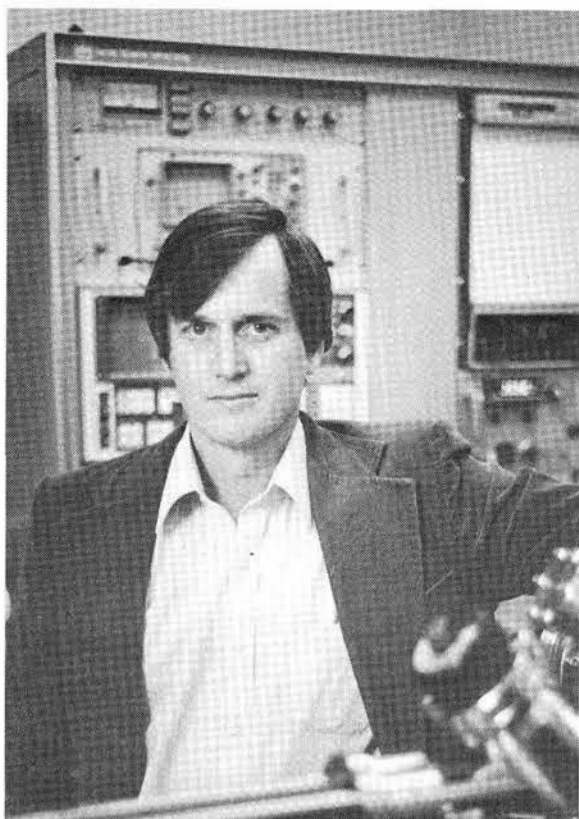


A two-passenger fiberglass car designed for urban travel may play a substantial role in Mexico's evergrowing transportation needs. Initial production of the Citadino subcompact, which has a top speed of 80 kilometers per hour, will be 20 to 25 a month. "This is minute when compared to market potential," says Guillermo Viniestra, general manager of Viniestra Vehículos Eléctricos, S.A. "Sales will determine how fast we expand."

Electric cars could help solve a number of Mexico City's traffic problems — not just pollution. The Citadino, only 2.10 meters long, would make both getting around and parking easier, its designers point out. The car has a sedan body, a 7-HP motor, disc brakes, and air shocks for each wheel. Range under city stop-and-start conditions is 60-80 kilometers with 120 kilometers possible on the open highway, without recharging.

At present, the Citadino is energized by six 6-volt, 180-ampere lead acid batteries. Each car comes with a battery charger. Time required to recharge is 6-8 hours, from any household electrical outlets. Each battery weighs 33 kilos. To prevent battery damage, the car will stop automatically when 75% of the charge is used. The Viniestra firm which started producing electric vehicles in 1976, pretty much has the Mexican market to itself. Its only other competitor is Citycar, an electric vehicle produced in Puebla on an order-only basis. Viniestra is designing a 10-passenger Microbus, powered by 16 lead-acid batteries.

R. Albert Denbow in *R&D Mexico*



WAYNE GOODMAN (1114) will receive the Ipatieff Prize of the American Chemical Society at the annual meeting March 21 in Seattle. The award is for important research in catalysis.

American Chemical Society Honors Sandia Scientist

Wayne Goodman of Surface Science Division 1134 is the 1983 winner of the American Chemical Society's Ipatieff Prize. The \$3000 award, established by the Ipatieff Trust Fund, is given every three years to a scientist under 40 years of age who has conducted outstanding experimental research in the fields of catalysis or high pressure chemistry. Wayne is being honored for his research on catalytic surfaces and his contributions to metal catalysis.

(The 1974 winner of the Ipatieff Prize was George Samara, manager of Condensed Matter Research Department 1130. The award was established by Vladimir Ipatieff, a Russian immigrant who held a number of patents on catalytic and high pressure devices. The award was first made in 1947.)

Wayne will receive his award March 21 at the annual meeting of the American Chemical Society in Seattle, where he will present a paper, "Chemical Modification of Catalytic Surfaces." Later the same week, he will present an invited paper at an American Physics Society meeting in Los Angeles on "Surface Science and Catalysis."

Wayne's work has particular application to coal gasification processes and production of other synthetic fuels from coal. His achievement involved correlating the results of basic scientific studies of catalytic materials and mechanisms under controlled vacuum conditions with the "real" world of ambient pressures and contaminations.

Before joining Sandia in 1980, Wayne was a research chemist at Exxon Research and Engineering Laboratories, Baton Rouge, and at the National Bureau of Standards in Washington.

He graduated from Mississippi College in 1968 and received his PhD in physical chemistry from the University of Texas in 1974.



THE RESEARCH of Ken Gillen (1813) and Roger Clough (1811) on the aging of materials is finding application in the realm of fine art. Representatives of the National Gallery of Art, the National Portrait Gallery, and the National Museum of American Art recently attended a seminar in Washington where Roger discussed results of the Sandia research and suggested experiments to determine the long-term aging effects of paintings under ambient conditions and the radiation effects to those subjected to low-level neutron radiography for art research purposes.

Rembrandt, Radiation, and Sandia

Materials Aging Studies by Sandians Useful to Keepers of Art Treasures

Sandia radiation effects researchers would seem to occupy a different world from that of the curators of artistic masterpieces. But the research of Roger Clough (1811) and Ken Gillen (1813) in long-term, low-level radiation effects and aging in materials, part of a safety study of polymers and cable insulation used in commercial reactor power applications (LAB NEWS, March 5, 1982), is finding new applications in the realm of fine art. Recently, Roger presented a seminar on the Sandia work at the Smithsonian Institution in Washington that was attended by representatives of the National Gallery of Art, the National Portrait Gallery, and the National Museum of American Art. Subject of his talk was "Methods for Predicting Aging in Organic Materials."

The seminar consisted of a general description of methods for thermal- and photochemical-accelerated aging experiments that could be used for examining long-term aging effects of paintings under ambient conditions. The paintings of concern were the organizations' art treasures, some of them already several hundred years old.

A second concern discussed was the effects of low-level radiation as used in neutron autoradiographic studies of paintings. These studies, conducted primarily by the New York Metropolitan Gallery, use a reactor radiation source at Brookhaven National Lab. The paintings are exposed to low-level radiation; then photographic film records images from beneath the surface of the paintings. The sophisticated technique provides information to art scholars and researchers on pigments used by the artists and the various subsurface images and brushstrokes used in the painting; it also reveals the underlying sketch or original drawing made for the painting.

Roger outlined accelerated aging experiments that could be used to look for long-term effects of neutron autoradiography.

"The Smithsonian Institution and National Bureau of Standards have indi-

cated that they intend to carry out the radiation aging experiments we proposed," Roger says. "The National Gallery will use the results in deciding whether to allow radiography to be carried out on their collection. Until now, the National Gallery has been reluctant to become involved with radiography."

"As part of the seminar," he continues, "we pointed out that, since radiation damage in organic materials is usually predominated by oxygen reactions, it is often possible to minimize damage by keeping samples under inert atmosphere during and shortly after the radiation exposure. In a discussion after the seminar, physicists involved in the radiography said that the idea of eliminating oxygen was something they had not done but which would be quite possible to incorporate into their facilities."

Since the seminar, Roger and Ken have corresponded with the museum officials and will serve as continuing consultants to the group.



The French government's campaign to reestablish French as a language of science [found itself] under severe stress — as thousands of foreign scientists descended on France for the 1982 conference season, attracted by the climate, the food and wine, and of course, the science. But these scientists mostly wished to speak English, not French, and there weren't enough technical translators to go round (nor money to pay them) ... The objection to English is that — outside Anglophone countries — it leads to the creation of an artificial barrier between those scientists who can cope easily with the language and those who cannot, so that English is used as a matter of status, and hence of isolation of one group from another. English thus militates against "democracy" in French science. Moreover, in France the government has taken an overriding interest in all means of increasing communication between scientists and industry, and this "snobbish" division is seen as a real barrier to industrial development.

Robert Walgate in *Nature*

Take Note

At the recent Great Southwest Council of Boy Scouts awards banquet, Gene Jeys (7252) was presented with the Silver Beaver scouting award, the highest recognition given to volunteers by the council. Gene has worked with the scout organization since 1957, always preferring to serve at a leadership level where he worked directly with the scouts. He also holds the Boy Scout Wood Badge, the highest adult leader training award. Gene is currently Scout Master of Troop 432 and assistant SM of Troop 4.

* * *

One of our group pictures of retiring Sandians in this issue just might be a record for husband and wife teams at the Labs. Doc (9210) and Mary (2426) Pasco and Tex (7482) and Evelyn (1630) Arterburn have a combined service of 119 years and 11 months at Sandia. Both couples are retiring at the end of February.

* * *

The Sandians, an organization of wives of Sandia employees and female employees of Sandia, is holding its spring membership drive. They provide educational, social, and other activities for members and help introduce newcomers to the city. General meetings are held on the first Monday evening of each month. Special interest groups also meet monthly, and there's a baby-sitting cooperative to solve the toddler problem. A couple of social events that include husbands are held throughout the year. Pat Willan at 821-3011 (after 6) has more info.

* * *

Ted Bowman, Family Development Director for Family and Children's Service of Minneapolis, will be the speaker at a public workshop on "Building Personal and Family Strengths" on Feb. 23 from 9 a.m. to 4 p.m. The workshop is sponsored by Parentcraft, Inc. Cost of the workshop is \$25; lunch is included. Bowman will discuss family functioning and how people can work toward improving family life. Call Parentcraft at 256-1191 for registration information.

* * *

If you've ever wanted to know what UNM's School of Engineering is up to these days, attend the Open House on Feb. 25 (9-5) or 26 (10-2). Go to the Engineering Complex at the southwest corner of the main campus and head for the information booth in the Farris Engineering Center. Both the general and the engineering-oriented publics are invited. More info from 277-4354.



Death

Paul Robertson of Project Engineering Division 9259 died Feb. 8 after a short illness. He was 60.

He had worked at the Labs since February 1952.

Survivors include his widow, two sons, and two daughters.



FURTHER DEVELOPMENT of the implantable, programmable insulin delivery system — artificial pancreas — received a boost as a result of contracts signed this month between the University of New Mexico and the Department of Energy, and between UNM and Shiley, Inc. (a subsidiary of Pfizer, Inc.). During the period of the agreement between UNM and DOE, Sandia will complete development of a second-generation system that will be lighter and smaller than the present version, which has been implanted in three diabetic patients. The new system also will have longer life and additional electronic controls. The Labs also will provide UNM's medical school with details, technology, and know-how so the system can be prepared for manufacture. Shiley will supply systems of its own manufacture to the medical school for clinical evaluation before building units for sale to the public. Shiley also will provide funds to UNM to support the Sandia development effort and the cost of clinical evaluation at the medical school. Shown above, during the contract signing at UNM, are (seated, left) John Perovich, UNM President, and Robert Curtis, Shiley Vice President and General Manager. Standing (from left) are Steven Thomson, Shiley Manager of Electromechanical R&D, Gene Reed (2000), and Ed Barsis (2330).

Santa Fe Opera Announces '83 Season

The Santa Fe Opera, in its 27th season, announces a 35-performance schedule for 1983 that will include five new productions:

Orpheus in the Underworld, Jacques Offenbach, sung in English and French. Performances on July 1, 7, 9, 13, 22, Aug. 4, 9, 18, 23, 25, and will close the season on Aug. 27.

Don Pasquale, Gaetano Donizetti, performed in Italian on July 2, 6, 8, 15, Aug. 2, 10, 16, 24, and 26.

Arabella, Richard Strauss, sung in German. Performances on July 16, 20, 29, Aug. 6, 11, and 19.

L'Orione, Pier Francesco Cavalli and Raymond Leppard. The American Premiere of Leppard's realization of Cavalli's *L'Orione* will be conducted by Maestro Leppard. Performed in English on July 23 and 27, Aug. 5, 13, and 17.

The Turn of the Screw, Benjamin Britten, sung in English. Performances on July 30, Aug. 3, 12, and 20.

The 1983 Santa Fe Opera Season runs

from July 1 through Aug. 27. For ticket information, call The Santa Fe Opera Box Office, 982-3855, Monday through Friday, between 10 a.m. and 4 p.m.

Congratulations

Olga (3544) and Joe Archuleta (3643), a daughter, Valerie Jo, Feb. 10.

Jack (9764) and Pat Jackson, a daughter, Jennifer Lee, Feb. 3.

Olivia (3522) and Sam (DOE) Harris, a son, Sean Edward, Dec. 20.

Louis (7412) and Margie Hernandez, a daughter, Olivia Maria, Jan. 30.

Sympathy

To Dave Williams (9424) on the death of his father, Jan. 16.

To Ted Ortega (3618) on the death of his mother in Albuquerque, Jan. 30.

Of Sheep and Ships and Skiing Wax

There are 70 million sheep in New Zealand and only three million people. So, not unexpectedly, a good deal of the island nation's life gravitates around the woolly rascals.

"Since New Zealand's basically a non-technical society, sheep-raising and agriculture are the big thing," Joel Miller (1521) tells us. "We stopped by the Agrodome, an exhibition hall for the sheep industry. A big sheep show was under way. The emcee described the traits and uses of each breed — each animal is trained to go to a special platform that has its particular breed name — and when the sheep hears its own breed name, it ambles over to its place. We also saw a sheep dog exhibition and, naturally, sheep-shearing demonstrations."

Did Joel Miller and Lisa Mondy (1512) go all the way to New Zealand just for this kind of mind-boggling excitement? Hardly, but let Lisa describe the trip.

"We flew 16 hours from Los Angeles to Auckland on the North Island, where we

picked up a rental car," she says. "It was winter in the southern hemisphere, but there was little snow when we arrived — the North Island winters are generally mild. Driving is on the left side of the road, so both Joel and I had to learn to shift with our left hands. And, of course, there were the sheep — they're everywhere and you have to stop frequently for herds crossing the road with the shepherders and their dogs."

"The North Island is the center of Maori culture — the Maoris are the Polynesian people who inhabited the islands before British colonization in the 19th century," Joel continues. "We attended a *hangi*, which is the Maori version of a luau. The food — ham, chicken, lamb, eel, marinated fish — was cooked in natural hot pools."

"The entertainment consisted of Maori dances and war games. The latter included a hand game — two men face each other and one tries to follow his opponent's rapid hand movements. All the while both men make fierce 'war faces' at each other, grunting at the same time. It's a relic of the old days, when warriors tried to frighten enemies by making faces at them. Maoris also do beautiful, elaborate carvings on their war canoes, weapons, and ceremonial houses."

Lisa and Joel drove to Wellington, which, in Lisa's words, is the San Francisco of New Zealand "with rolling hills down to the bay, sailboats everywhere, and snow-capped mountains in the background." From Wellington they took the ferry to the South Island for a little midsummer skiing — speaking ethnoclimatically, that is. Their destination was the ski resort of Queenstown.

"But first we took a cruise ship around Milford Sound, one of the breathtakingly beautiful fjords on the southwest coast of the South Island," says Lisa. "The boat took us under sheer cliffs and mountains rising up to 9000 feet from the sea and covered with thousands of waterfalls, some of which fell 3000 feet. The area receives 300 inches of rain annually, and it's incredibly green."

Queenstown is not a big resort by American standards. The ski areas of New Zealand are not as developed as those in this country; most consist of one rope tow or T-bar, although Queenstown had two chairlifts, "like Santa Fe." Lisa and Joel stayed four days at Queenstown, skiing at adjoining Cornet Peak.

"At Mount Cook, there's both helicopter and plane skiing, and it had just snowed very heavily," says Joel. "Skiers with all their gear get on a small plane with the skis strapped under the left wing. Our plane landed at the top of Tasman Glacier, and we skied down. At the bottom, another plane was waiting to fly us back up. The glacier is 11 miles long and over one mile across at its widest point. Each ski run takes two and a half hours. Along the route are deep crevasses and chunks of ice 25 feet high, some with huge holes caused by melting."

Adds Lisa: "The guide jokingly told us there was a 2000-foot base so we wouldn't hit any rocks. He claimed they hadn't lost



WATERFALLS cascade thousands of feet, forming a dramatic backdrop at Milford Sound, one of New Zealand's many scenic attractions.

anyone down a crevasse in seven years. The guides are top-notch mountaineers. One of them was the second New Zealander, after Sir Edmund Hillary, to climb Mt. Everest. The scale of the glacier was just awesome — it was surrounded by sheer precipices and towering mountains."

Lisa observes that the standard of living in New Zealand seems closer to that of the U.S. than to most of Europe. But there are only a few large cities: Auckland is the largest with 800,000; Wellington, the capital, and Christchurch each have about 300,000 inhabitants.

"New Zealanders are very friendly and open people," she says, "perhaps because they travel extensively and know what it's like to be a tourist. We met waitresses, teachers, and average people from many walks of life who had been in America and Europe. Their speech is much easier to understand than the English of Britain — it's lyrical, a bit like upper middle class British. And they're quite sensitive about

their speech being compared to the Australians'.

"The food is really cheap and very good — many fresh vegetables, cheeses, and seafood. We were warned about the food — that it was similar to English cooking — but we were pleasantly surprised. It's a beautiful country with varied terrain — about the size of Colorado. New Zealand is greener in the winter than Albuquerque can ever hope to be in the summer. Fruit trees bear fruit in the North Island, flowers bloom in the dead of winter. It's a very mild climate until you get high enough to ski."

Logistics: Air fare was \$695 round trip from Los Angeles to Auckland with a two-hour layover in Honolulu.

The land package was \$30 a day, and included unlimited mileage car rental, vouchers for motels throughout the country, and discounts on skiing and sightseeing. Interestingly, almost all medium-priced motels have kitchens; expensive ones are U.S. style.



SHEEP know their places at the Agrodome, an agricultural exhibition hall.

NOTE: Do not send Feedback items to the LAB NEWS. To get a response to your comments and questions about Sandia Labs, complete a Feedback form (available near bulletin boards) and return it to the Feedback Coordinator, Division 3161. The substance of questions and responses of wide interest is published in LAB NEWS.

Q. The plans for the additions to Bldg. 804 (the Tech Library) that are now on display in the original building show that the addition will have a south-facing concrete wall 80 feet long and 22 feet high. This wall will have no windows. It would appear that this wall could easily be made into a trombe wall. Given its size, it could probably heat most of the new addition. Why was not passive solar incorporated into this new addition?

A. Thank you for your interest in energy conservation. The addition to Bldg. 804 is a part of the FY '82 General Plant Project Construction program that also includes building additions to 868 and 864, a new building east of building 870, street paving, utility work, and the conversion of the building 836 courtyard to two floors of usable space. The \$3,950,000 total for this effort has had to be carefully monitored in order to cover all this work; all projects have experienced cost reductions during the design phase to control the individual and overall budgets.

In the case of the Library addition, we simply could not afford the additional first costs of a trombe wall. The concept was considered early in the design, but a comprehensive analysis was not made because of the budget restraints. A trombe wall for this space would probably not have proved as cost effective as one in the new warehouse (Bldg. 954), the Photovoltaics Bldg. 853, or the Solar Tower Assembly Bldg. because of the available storage mass inside the building, the need for a substantial eyebrow to provide summer shade for a high wall, the two-level stack area complication, and the need for uniform distribution of conditioned air to the full depth of the building addition. We are insulating the building on the exterior to allow the thermal mass to flywheel during the shut-down phase of the air conditioning cycle. We attempt to utilize favorable "cost-to-benefit ratio" energy conservation ideas in all our projects, but we cannot include all of the features that might be of some value because we do not have money available to supplement the normal construction budget.

R. W. Hunnicutt-3600

Q. The closing of Gate 1 at 5:30 p.m. is inconvenient to those of us who commute by bicycle and get caught by late meetings. We are unable to get our bikes out through the MARDIX booths so we have to ride to Gate 10, then farther south and west to Main Street.

Most of us live somewhere north of the tech area. To be forced to ride south to gate 10, then farther south to find access to Main is a long distance out of the way. I can understand the rationale that manpower does not permit both Gate 1 and Gate 10 to be open all the time. But the excuse that more people need access to the south of the area and therefore Gate 10 should be the one left open does not make sense to me. If people have vehicular access, what difference does it make whether they enter at Gate 1 and drive to Gate 10 or if they drive around the military buildings to Gate 10 and enter there. And if they need just pedestrian access, there is a MARDIX booth conveniently located at most places around the area, including one in Bldg. 822. Why can't Gate 1 be the one left open?

A. In view of the population shift to the southeast side of Tech Area I, it is logical to move the 24-hour gate to that location for these reasons:

- It places armed security personnel on duty 24 hours a day in the immediate vicinity of the most traffic and greatest number of people. That is, it provides an obvious security presence where we think we need it most.

- It tends to direct vehicular traffic, especially during non-operational hours, to the high population area, reducing travel through the other parts of Area I.

- As the population shift continues, the Mardix booth in Bldg. 822 will be unable to handle large after-hours population movements. However, in an effort to accommodate those with the problem you mention, we have extended the Gate 1 closing time from 5:30 to 5:45.

D. S. Tarbox - 3400

Q. Any chance of getting back into the Lovelace Health Maintenance Organization? It keeps accepting new groups and has even taken back some old ones (UNM, for example). I understand Lovelace took Sandia out of its HMO because of our over-utilization, but surely there is some way to curb abuses.

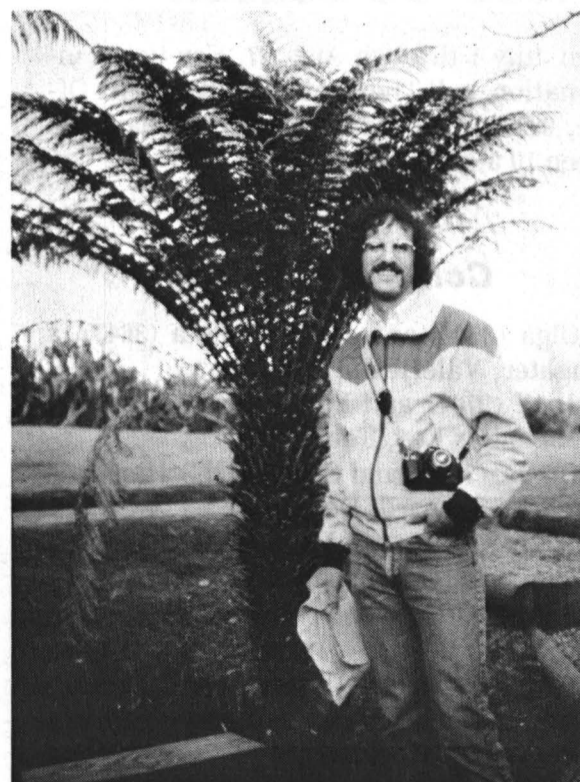
A. Lovelace and Mastercare, the two HMOs with which Sandia has been affiliated, cancelled their contracts with us because of various financial reasons, including over-utilization and declining enrollment. The national percentage of HMO failures due to fiscal problems continues to be high. Therefore, we do not feel that it is in the best interest of our Albuquerque employees to actively pursue participation in a local HMO at this time.

Although the Lovelace HMO is expanding and reacquiring former participating employer groups, it has not resolicited Sandia's participation. If, in the future, the success of a local HMO appears encouraging and the HMO is willing to include Sandians, we will consider offering an HMO plan again.

J. R. Garcia - 3500



LISA MONDY (1512) tries to make friends with one of the natives, who seems uninterested.



JOEL MILLER (1521), somewhere in New Zealand.

Fun & Games

Rafting — 15 or so people told Mark Percival (9734) that they were interested in rafting the Grand Canyon. Another 15 and the cost becomes \$630 each with pickup at Flagstaff before the trip and return to Flagstaff after. Tentative dates are June 15-20. Call Mark on 299-6606 evenings if you'd like an intimate look at a fantastic place.

* * *

Mini-marathoning — The City Parks and Recreation Dept. is sponsoring a 13.1-mile run on March 13 at 9 a.m. beginning at the entrance to the Paseo del Nordeste Bike Trail near the corner of Tucker and University NE. Early registration (March 1-9) is \$5; \$7 later. Finishers get the mandatory T-shirt; winners in each age and sex category awards. Registration and info from Parks and Recreation, 121 Tijeras NE, on 766-7427.

* * *

Clogging — The Sandia Mountain Stompers offer beginners lessons in the classic hillbilly tap dancing art. Lessons begin March 1 and continue each Tuesday evening from 7 to 8:15. Workshops for experienced cloggers are from 7:30 to 9:30 on Thursdays. Site for both is the YWCA at 4th and Lead SW. (Parking is free and well-lighted.) Fees are \$1.50 for adults, 75¢ for kids per lesson — it's a family affair. Available to inspire are Virginia O'Neil (3152), Ralph Smith (6001), and Peggy Wallace (6021).

* * *

Arts & Crafts — Sandians and DOEans, plus their spouses and dependents, are not only eligible for classes at the Base's Arts and Crafts Center but can now get up-to-date information on what's being offered there — and at a discount off the already low fees yet. C-Club Recreation Manager Tom Lenz has the spring schedule of classes and info on the discount.

* * *

Running — If you're running more than 20 miles a week and doing it solely for aerobic fitness, you may want to reconsider your running program. Call Tom Lenz on 4-8486 for a copy of an article by Dr. Kenneth Cooper. If the mere contemplation of running more than 20 miles a week nauseates you, leave Tom alone.

* * *

Running Shoes — Going out and buying a pair of running shoes sounds pretty easy, right? But, thanks to computers and new knowledge, it's now an appropriately complex task. Would-be runners without any sole or who don't know terms like "quaters" (sic), "heel counter stiffness," or "ethyl vinyl acetate" should call Tom before buying a pair of \$9.95 specials.

* * *

Events Calendar

Feb. 18-20* — Classics Theatre, "King Lear," 8:15 p.m., *2:15 p.m., Popejoy.

Feb. 18-20 — Shrine Circus, Tingley Coliseum, 766-2627.

Feb. 21-23 — Broadway musical, "Annie," returns for special three performance run; 21st at 7:30 p.m., 22nd & 23rd at 8:15 p.m., Popejoy.

Feb. 24 — Preview of March production, "Remembering Us," director and playwright will answer any questions, refreshments, no admission, 7 p.m., Vortex Theatre (Buena Vista at Central).

Feb. 26 — The Scandinavian Club presents The Gjevre String Orchestra, ethnic music of Norway and light concert music; coffee and Scandinavian desserts available, 2 p.m., KiMo, 766-7816.

Feb. 26 — Albuquerque Opera Theater honors J.D. Robb. An evening of opera by the composer "Little Joe." A Spanish folk drama of NM. 8:15 p.m., KiMo, reservations: 298-0881, 243-0591.

Feb. 27 — NM Symphony Orchestra Pops concert, 4 p.m., Kiva Auditorium, Albuquerque Convention Center.

Feb. 28 — The Theatre Marionettes in "Orlando Furioso," 7 p.m., KiMo, 766-7816.

March 5-7* — Ballet West presents "Swan Lake" with NM Symphony Orchestra, 8:15 p.m., *2:15 p.m., Popejoy.

Retiring

RETIRING THIS MONTH and not shown in accompanying LAB NEWS photos are Willard Clark (2360), Roberta Rainhart (2521), James Drake (2552), Nell Arnett (3141), Beulah Amole (7135) Erwin Lehmann (7481), William Edwards (7471), Charlotte Marks (3141), Chuck Freund (3743), Jim Kelly (3551), Dorothy Washburn (3742), and Bruno Paoletti (7362).



Harry Pastorius (3000)



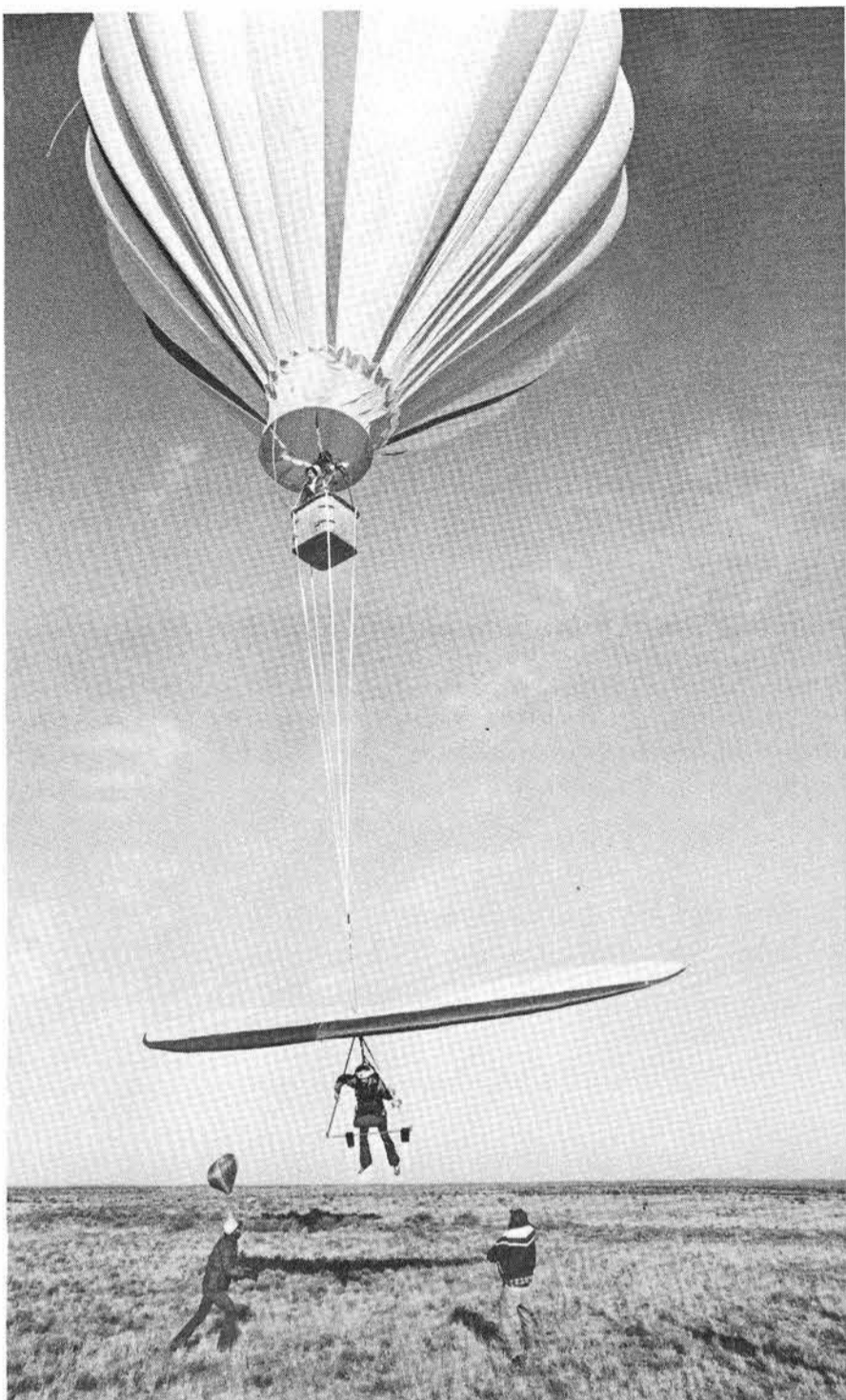
Tex Arterburn (7482), Evelyn Arterburn (1630), Doc Pasco (2426), and Mary Pasco (9210).



Standing are Bert Neumon (2154), Ernest Fuentes (2551), and Bob Hartenberger (3618). In front are Paul Hamilton (748), and Bernardo Gallegos (3741).



Chuck Lee (9222), Earle Paxton (400), Bill Whalen (7523), and Doug Ballard (7551).



Sandian Soars On Balloon-Launched Hang Glider



AIRBORNE — Bob Carlton (7481) recently combined his love of, and skills at, hang gliding with a balloonist friend's capabilities to head for the skies suspended from the balloon. Once about 6000 feet above the launch site west of Rio Rancho, he cut his hang glider free, rode it straight down for 50 feet or so, then pulled it out of the dive, and celebrated the whole event with a few wingovers before landing near the take-off point.



COCOON HARNESS holds Bob securely to the hang glider. Once aloft, it folds down to support the pilot's prone body from shoulders to feet (which will fit into pocket shown here at Bob's stomach). Bob has had 2½ years of glider experience.



TRICKIEST PART of the flight was the launch, especially with an 8 mph wind. Balloon had to be behind — up-wind from — Bob's hang glider, then lift up and over him. Balloon pilot was Paul Smith. Bob's hang glider is a 70-lb. Sensor 510 with a 35-foot wingspan and 180 square feet of sail. It has a 10:1 glide ratio and is capable of 65 mph airspeed. Balloon launches are not recommended for novice glider pilots.

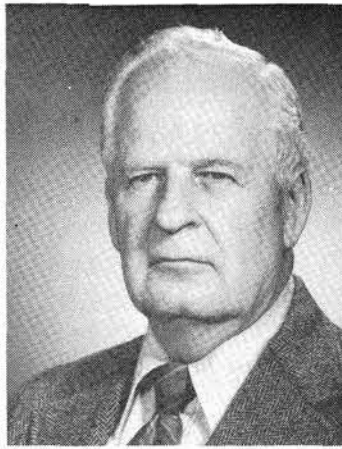


RELEASE MECHANISM is checked by Bob before the flight. The hang glider was suspended 30 feet below the balloon gondola on 130 feet of nylon webbing. The release, a British Army surplus item, allowed Bob to pull a cord and cut himself loose from the balloon at altitude.

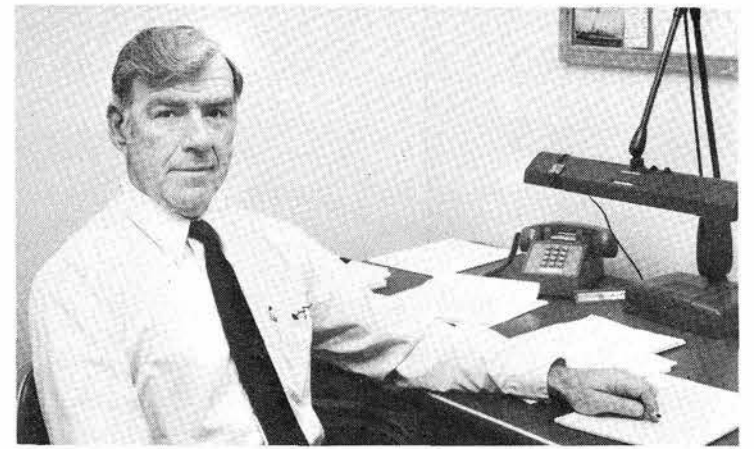
MILEPOSTS

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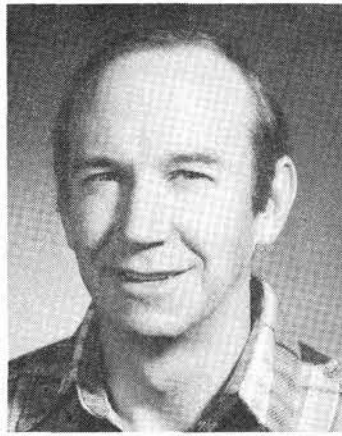
Bob Roberts - 2313 30



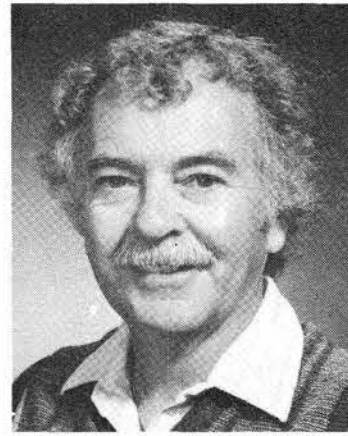
Jack Willis - 2121 25



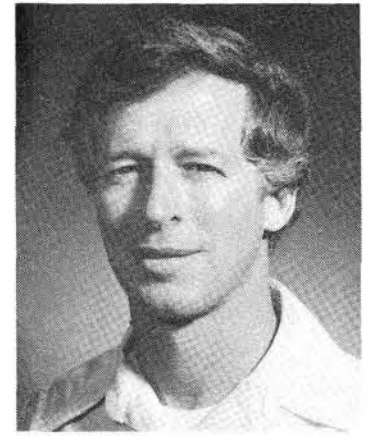
Jose Gutierrez - 3423 20



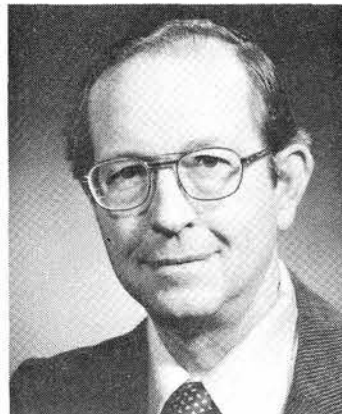
Dwight Lambert - 9442 15



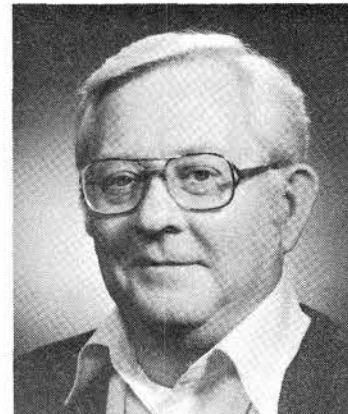
Lial Brewer - 3310 20



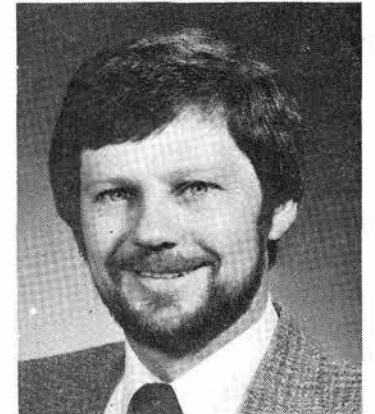
Vic Schulze - 0324 20



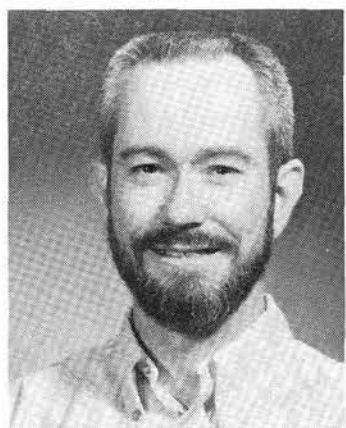
Mel Brock - 7265 30



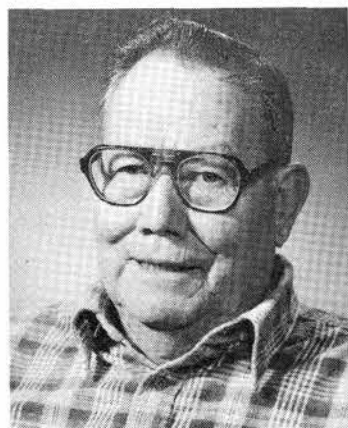
Cliff Magnuson - 1522 30



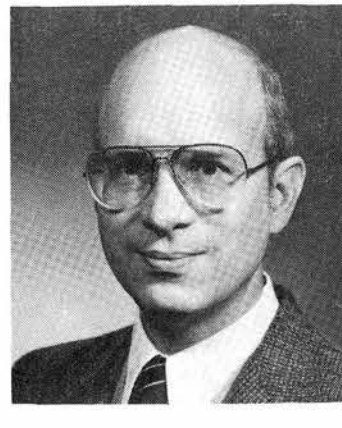
Ward Bower - 2364 20



John Long - 7523 15



Frutoso Gurule - 3612 20



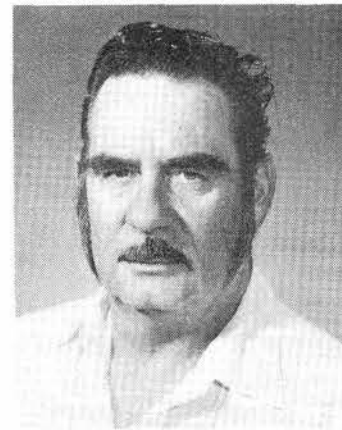
Roger Roberts - 2121 20



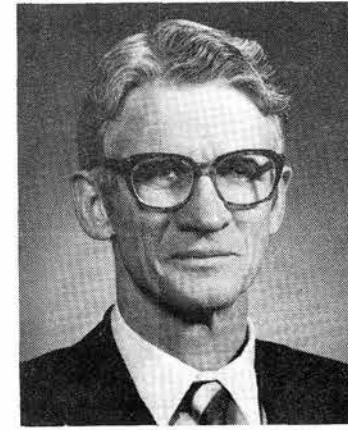
Don Marchi - 2515 15



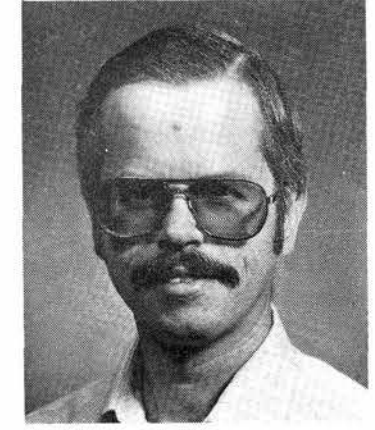
Bob Durand - 3741 35



Revel Rainey - 3611 10



Walt Dalby - 9311 30



Doug Schuler - 2541 15

A Spatial Kind of Warfare

Space is the final frontier as the syndicated Capt. Kirk keeps telling us. Its finality might be of another sort if the worst case scenario presented recently by Richard Garwin ever comes to pass. Garwin, a defense analyst with IBM's Thomas J. Watson Research Center in Yorktown Hts., NY, and a former consultant to NASA and the military, discussed various aspects of warfare in space.

Some planners see space as an ideal region for defense because radar and light travel freely, permitting advanced sensors to operate much more efficiently. The vacuum of space allows propagation of powerful laser beams, neutral particles, and x-rays. Even small pellets can enjoy unimpeded flight, posing a deadly threat to fragile and unprotected satellites.

The non-weapon satellites we have now (communications, weather, imaging) are very vulnerable and very expensive — each one costs tens of millions of dollars. And, in the absence of a comprehensive treaty

banning weapons in space, we can't prohibit the Soviets from placing small vehicles in orbit next to our own large vehicles. On command, such satellites could be detonated, destroying our defensive system.

One counter argument is that we can defend against ballistic missiles by placing in orbit sophisticated satellites that will destroy enemy missiles with powerful laser beams — at a cost of tens of hundreds of billions of dollars. Garwin is not convinced. A ballistic missile defense system would have to detect and knock out several thousand boosters in a couple of minutes. Besides, the Soviets can take countermeasures against our laser defense: hardening their rockets; spinning them; attaching a shield to the missile to deflect the laser beam; launching decoys; or even launching a preemptive attack on our laser satellites.

Garwin believes that close-in defense of silos is cheaper and more effective than the

expensive, hi-tech systems. He suggests, for instance, a system of "kleenex radars" placed at various distances from Minute-man or Peacekeeper silos. When an incoming missile is spotted, a low-yield bomb a mile from the silo would be detonated under the surface of the earth and destroy the missile with rocks and dust.

Garwin concludes that a space war cannot be limited to space — it would soon spread to the planet's surface. The best thing is to avoid it altogether. We need a treaty banning weapons from space, he says, because it's in the national interest. Until we have the treaty, however, we should develop our defense systems, especially F15-launched anti-satellite weapons.

Besides, as Garwin once told Sen. Henry Jackson, the only way we can have true equality with the U.S.S.R. is to have a joint weapons development program with the Soviets, and exchange half of our weapons for half of theirs.

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

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (M0125).

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

- POOL TABLE w/accessories, full size, \$135. Reber, 298-6053.
- GUITAR, TAMA-TC8 classical, case, \$250; Scott stereo amp & lg. speakers, \$175. Miller, 242-1894.
- KING SIZE BED, mattress, box springs & frame. Goode, 294-3116.
- MESILLA VALLEY pecans, \$1.25/lb. in the shell. Dalton, 884-1205 after 5.
- FISHING FLIES, custom tied, lg. inventory, std. patterns, \$7/doz. Swanson, 884-8650.
- PING PONG table, 3/4" stablely top, roll-a-way, playback w/casters, \$45. Rody, 299-6084.
- ADMIRAL STEREO console, \$60; Olympia manual typewriter, \$40. Padilla, 296-5048 after 5.
- BEDROOM SET w/orthopedic mattress, \$300; dinette set, \$300; couch & chair; Lane end and coffee tables; wheelchair; tripod cane. Sanchez, 836-3060.
- 2 TIRES w/wheels, 6.50x16 Sears mud-snow tread, 6-ply, 5-hole off-white wheels, Ford truck, \$22 ea. Trump, 299-5162.
- REPAIR MANUAL, '73 Chilton's import car, free. Berg, 296-2695.
- SKIS 170cm Trucker Quicksilver, used 2 seasons, \$95; 160 cm Hagens, \$35; bumper pool table, \$85. Lassiter, 299-1492.
- COMPUTER: Sinclair ZX81, \$50. Gerstle, 298-7854.

- BUNK BEDS: solid maple, \$175; sofa, extra long, brown, \$50; ping pong table, \$15. Shire, 821-8460.
- SEARS speed control 28-20303, new, \$50; shop manuals, \$10; C6 filter & fluid, \$5; 1973 Ford. Roberts, 255-9527.
- BENNETT pressure breathing therapy unit for asthma & emphysema, \$100; 1 set railroad telegraphy instructograph, 8 tapes, key, instruction book for Morse code & conventional signals, \$50. Ford, 299-3331.
- VIVITAR telephoto lens, \$50; HD Calking size waterbed mattress w/fiber fill and safety liner. Conklin, 821-6181.
- SPRINGCREST curtain rod, extends to 15'. Stewart, 298-3332.
- GE 19" color TV. Chavez, 298-2405.
- TRUNDLE BED set w/blond headboard & footboard, steel link springs, mattresses, \$50. Williams, 268-0045.
- PRINTER CENTRONICS 101A, dot matrix, upper case only, 15" carriage, parallel interface, \$180. Chu, 298-1073.
- INTEGRATED amplifier, Nikko, 15 WRMS/channel, compact, \$20. Eastman, 268-2891.
- LOVE SEATS, cost \$900 at Modestas, \$250 ea. Magnuson, 821-5330.
- BMX BIKE PARTS: JMC chrome frame, forks, headset, Sbb crankset, Dura-Ace alloy crankset, Redline V-bars, all for \$225. Sparks, 898-1252.
- 2 TIRES on wheels, 5-hole, 14x7.50; ladies suede coat, med. size, tan; heavy metal box for small truck (24x18x15); barrels, fiber, 10-gal. Harris, 255-6577.
- STEREO system, Pioneer speaker system, 160 watt AM/FM stereo receiver, \$175. Fleming, 888-3171 after 5.
- 1 PAIR L60x14 tires mounted on 14x10 white spoke wheels, \$55. Nelson, 881-0148.
- OLD MODEL 22 cal. flat gate Ruger pistol, 4-digit number, \$200; Bicentennial model 77 - 257 cal. Savage rifle, \$350. Zamora, 897-3465.
- APPLE II Plus w/CRT, disk drive & 80 col. display. Shead, 292-2420.
- DAHLQUIST DQ-10A mirror imaged speakers w/KEF T-27 tweeter modification, black grills, walnut trim, stand included, best offer. Booth, 296-3955.
- FLORAL PATTERN sofa & love seat, make offer. Anderson, 265-0403.
- CURTAINS: double sheers, off-white, pinch pleats, 148"x81". Adams, 881-6836.

- DINETTE w/4 chairs; 2 5-drawer chests; nightstand; queen size headboard; glass/chrome coffee table & etagere (shelves). Sanchez, 299-0443.
- FIREPLACE ITEMS: 2-spd. heat exchanger, \$20; 5-tube heat pipe grate, \$7.50; brass bi-fold glass door screen, \$25. Meyer, 296-9066.
- FIBERGLASS garage door w/mounting hardware, 9'x7', \$25. Phipps, 299-3151.
- REFRIGERATOR; washer; furniture: bdrm., kitchen, den, etc. Lang, 299-1013, 884-8976.
- ROCKING HORSE, wooden, sturdy, safe, stable, handmade, \$50. Pershall, 822-0814.
- ANTIQUA wall clock, inlaid striker. Hey, 898-6679.
- VIOLIN, full size, bow & case, from Mittelstadt, Germany, \$400. Moss, 298-2643.
- RELOADING PRESS, HD, Herters, dies, 30-06, .243, 44 mag., scale, powder measure, misc. primers; shotshell reloader. Lyman EZ Load. Tessler, 296-7587.
- FRIGIDAIRE refrig.-freezer, \$80. Chavez, 877-8354.
- OFFICE DESK, 3'x6', wood, 5-dwr. including file dwr., \$150. Stackpole, 821-5348 after 6:30.
- 8-TRACK tape record/playback deck, Panasonic RS-803US, plus about 20 tapes, some blank, some recorded, \$50 takes all. Hughes, 299-6674.
- JVC portable stereo cassette deck, 120VDC or 120 VAC, Dolby NR high-bias tape, playback speaker, \$125. Brooks, 883-1485.

TRANSPORTATION

- '67 MOTORCYCLE, BMW R60. Rody, 299-6084.
- '81 DODGE Mirada, 2-dr., bucket seats, PS, PB, AC, radio, midnight blue w/off-white simulated convert. top, new radials, \$6500. Robinson, 293-8851.
- '72 MUSTANG, white w/blue interior, hatchback model. Romero, 299-5189.
- '75 IMPALA, AT, AC, PB, PS, radials, 350 engine, below book. Moya, 865-5765.
- '64 INTERNATIONAL SCOUT, 4-wd. Harrington, 822-0660.
- '74 DUSTER, 6-cyl., \$800. Chavez, 268-3221.
- '76 GMC mini motor home, 350 CI, AC, PS, cruise control, sleeps 4. Kanolt/Nehe, 266-0715.

- '81 MUSTANG, 2-dr. cp., 4-spd., AM-FM stereo cassette, retail \$4875, sell \$4000. Speller, 242-8532.
- '71 VW Bug, 4-spd., stick shift, new tires, \$2200 or best offer. Palmer, 299-4722 after 5.
- '80 FORD Fairmont, 4-dr., 4-spd., 4-cyl., recent tune-up, \$3050. Martin, 869-2049.
- '79 TRANS-AM, 402 engine under 24K miles, AC, AT, tilt steering & more, \$6500. Wallace, 294-2870.
- '76 AMC Hornet, 2-dr., std., 15K miles, new battery, radials, \$3800. Korbin, 821-9658.
- '79 MAZDA RX7 GS, sunroof, louvers, back spoiler, stereo, \$6700. Platzbelker, 292-6866.
- '82 HONDA Ascot FT500, elec. start, red, 50 mpg, \$1600. Ramz, 294-2054.
- '79 DATSUN pickup, King cab, bucket seats, FM radio, almost new tires, low mileage. Reynolds, 268-9618 or 883-7151.
- '79 DODGE truck, 1-ton, flat bed, 15-ton PTO, winch, 26K miles, \$6900. Rarrick, 298-8240.
- '79 OLDS Starfire, V6, AC, hatchback w/louvers, low mileage, AM-FM cassette, \$3995 or best offer. Rush, 298-1418.
- '81 CHEVY Citation, 17K miles, \$5400. Eley, 296-3185.
- '65 GMC K000 4-wd carryall, 305V6, 4-spd., HI/LO, warn hubs, PTO 4T, Ramsey winch, Aeschliman, 281-1227.
- '59 CHEVROLET, V8, 15-passenger bus, 80,522 miles, new tires, battery & seat covers, \$1200. Brown, 268-8260.
- '76 FIAT 128, \$300/make offer. Barton, 268-7349.
- '75 HONDA CB-550, \$900 or best offer. Chavez, 877-8354.
- '78 HONDA 750K, \$1600 includes Bell helmet. Hinkel, 296-8948.
- '79 VW Scirocco, sunroof, stereo, 88K miles, \$3700 or best offer. Harrell, 292-6850.
- '64 WILLYS Wagoneer, 4-wd, 327 Chevrolet engine, new tires, battery, shocks, etc. \$1700 or best offer. Bailey, 268-8079.

REAL ESTATE

- 4-BDR., 2-story Presley, 1800 sq. ft., earthtones, hottub, redwood deck, full city view, Springcrest drapes, 3 yrs. old, FHA 10% loan. Nation, 299-9213.

WANTED

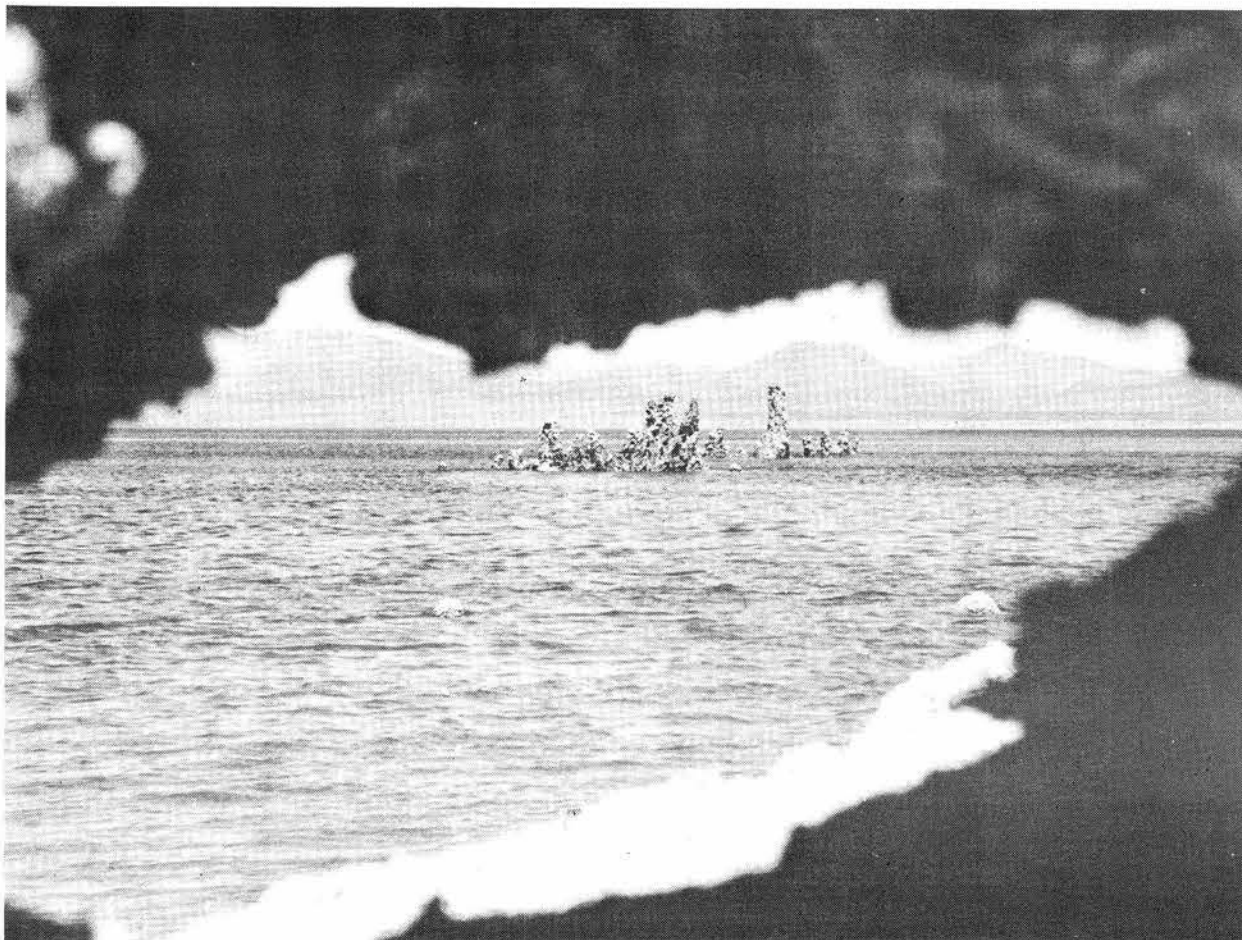
- START or join toddlers play group, ages 2 through 4. Chavez, 298-2405.
- FULL SIZE luxury station wagon, 1979, any GM make w/cruise, power windows, etc., less than 40K miles. Pope, 816 Val Verde SE, 255-6702.
- TRAVEL TRAILER, 8' wide, 18 to 20 ft., must be in good condition. Yingst, 884-3812.
- AWNING for travel trailer. MacInnis, 898-1628.
- 35MM SLIDE PROJECTOR. McIlroy, 299-4977.
- 1 SECTION Rohn 25 tower. Graham, 298-7005.
- SKI CARRIERS, hard-sided, borrow or rent; to protect ski club members' equipment from airline baggage handlers. Mackel, 296-3167, Schkade, 292-5126.
- ROOM MATE to share expenses on 3-bdr. house, NE, 10 min. from Sandia, approx. \$200/mo. Gabaldon, 292-7340.
- RELIABLE person to install small amount of kitchen carpet for small price. Trompak, 298-6671.
- VIC-20 accessories, Datasette, printer, cassettes, such as basic programming, home-finances, etc. Adams, 256-7265.
- NCAA basketball tournament tickets. Price, 821-0431.
- SANDIA slow-pitch softball league players for new team. Hannum, 4-7500.
- AUTO manuals for '71 Cougar. Snyder, 296-5771.
- CAMPER SHELL for Ford Courier pickup, 6' bed. Chavez, 836-4069.
- ROLLEI 35mm (35S or similar) compact range finder camera, semi-auto. Brooks, 883-1485.

WORK WANTED

- HOUSE sitting, references, children & pets fine, no reptiles. Brown, 266-2266, 7 a.m. - 3 p.m.
- STUDENT w/pickup wants light hauling jobs. Bryan Fisher, 298-0526.

SHARE-A-RIDE

- VAN Pool from Belen, \$11.25/wk., cheaper rates from Los Lunas & Bosque Farms. Trujillo, 865-5438.
- SHARE EXPENSES for ride to and from work, vicinity of Louisiana & Constitution NE. Rose Ann Schultz, 255-0686.



Coronado Club Presents

Kiddie Carnival Set Feb. 26

TONIGHT at Happy Hour, cornish game hens top the buffet line while a country and western group called Borderline holds the bandstand. The buffet (adults \$6, children \$3) is served from 6 to 8, the music starts at 7, and Happy Hour prices are in effect from 4:30 until 7. Next Friday, Feb. 25, Frankie and the Corvettes, a popular variety band, makes the music while surf 'n turf, a two-for-one special at \$14.25, is the buffet feature.

ANNUAL KIDDIE KARNIVAL is scheduled Saturday, Feb. 26, from 10 a.m. until 2 p.m. with games, clowns, and prizes all over the place. Ring toss, bumper cars, fish pond, and bean bag toss are some of the featured games. Hamburgers, hot dogs, and French dip sandwiches will be available. Admission is \$1.50 for children 12 and under accompanied by a parent. (The main lounge will be open). Prizes for game winners and door prizes will be given away.

SOMETHING NEW comes to the Club on occasional Tuesdays — after-work dining with a special two-for-one price. Mark Tuesday, March 1, for a night out. Enjoy prime rib *au jus* for two for \$11.50. Salad, baked potato, and vegetable *du jour* complete the dinner, which is served at your table. Pianist Alex Montoya plays dinner music. Stop by between 6 and 8:30 p.m. Try it again on Tuesday, March 29, when surf 'n turf for \$11.50 is the two-for-one special.

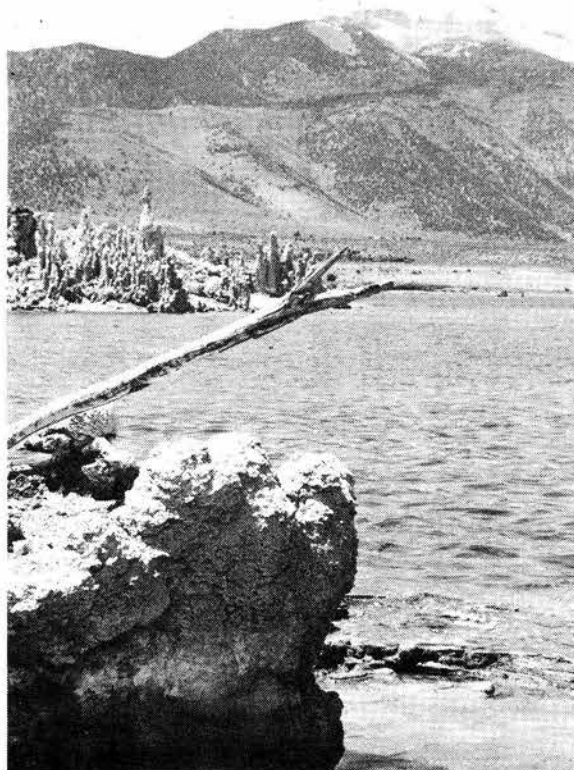
VARIETY NIGHT adds a live performance of the Williamson Wuppeteers on Saturday, March 5. A couple of local youngsters perform a professional show appealing to kids of all ages. The scheduled movie is "20,000 Leagues Under the Sea," a Walt Disney film starring Kirk Douglas, James Mason, and Peter Lorre. This is Jules Verne's classic story of the submarine Nautilus and Captain Nemo, the first militant for world peace. Super sandwiches are available at 5, the puppet show starts at 6:15, and the movie at 7. Admission is 50 cents per child accompanied by a parent-member.

SINGLE MINGLE '83 is now scheduled Saturday, March 12 with Spinning Wheel booked for the occasion. Open to all singles on Base, the event should be a blast. Mark your calendar now and save \$2 for the cover charge.

TRAVEL DIRECTOR Shirley McKenzie (2432) has a few seats left on both San Diego/Disneyland tours scheduled March 26-April 2 and April 4-9. Visit Disneyland, Marineland, the San Diego Zoo and other attractions for \$328. The price includes airfare, lodging, transfers, local transportation, and admissions.

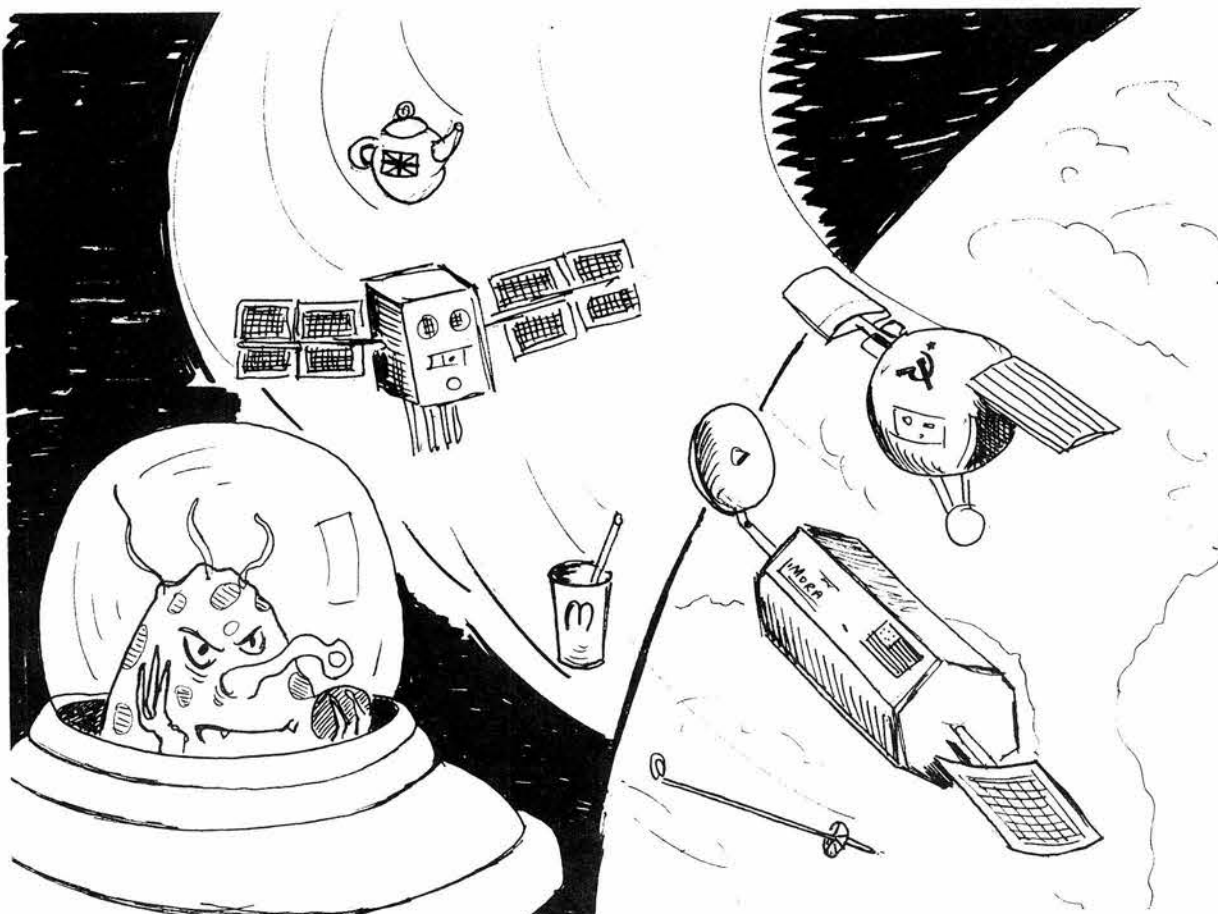
Now is the time to sign up for the Hawaii package April 16-24. The price is \$580 if you stay at the Beachcomber, \$652 if you stay at the Outrigger.

The Caribbean cruise package on the Norwegian cruise ship *Starward* is scheduled Oct. 22-Nov. 5. Cost is \$1095 (double occupancy).



Vista California

MONO LAKE TUFA STATE RESERVE — Just east of Yosemite National Park's Tioga Pass entrance is an awesome sight — Mono Lake and its surrounding geologic features. The lake, estimated to be a million years old, is part of an active volcanic region in the Sierra. It has been slowly drying up because its tributary streams are being diverted to provide water for Los Angeles. Striking stone formations in the water and along the shore are the unique tufa towers, formed when fresh water springs under the lake interacted with the alkaline lake water, creating these limestone-like deposits that have survived the shrinking lake level. In 1982 the lake and shore area was preserved by the creation of a California State Reserve, but the water level is continuing to recede because of increased demands for fresh water in Southern California.



"I'm here stuck on the on-ramp, chief. Earth orbit traffic's really heavy this morning."