

"THE SECRET of success is the slant of the ribbons in these rear gores," says Ray Rychnovsky (8158), who originated the lifting parachute. Tests show the chute works well with loads that need to go up before they come down.

Parachutes That Go Up

Some kinds of loads dropped by parachute from low-flying, high-speed aircraft need to go up before they go down. That's not easy, even if the parachute designer has unlimited weight and volume to work with.

Ray Rychnovsky (8158) didn't. His job was to develop a chute that would survive the shock of being deployed at transonic or supersonic speeds; glide up, well above the altitude of the release aircraft, before gliding down; perform this maneuver in less than 10 seconds — release altitude may be as low as 30 m (100 feet) above the ground; and do it all with severe restrictions on chute weight and volume.

"The chute system we are developing," says Ray, "is a concept I proposed some time ago but never had an opportunity to test. Basically, it consists of two parachutes. The first stage lifts the payload after release and slows it down to allow second stage deployment.

"The second stage is a conventional ringsail parachute. It's the first one, the lifting one, that's unique. It's a 24-gore ribbon type with slanted ribbons in the five gores at the

(Continued on Page Three)

LAB NEWS

VOL. 27, NO. 13

JUNE 27, 1975

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

Bill Snyder Heads New Directorate

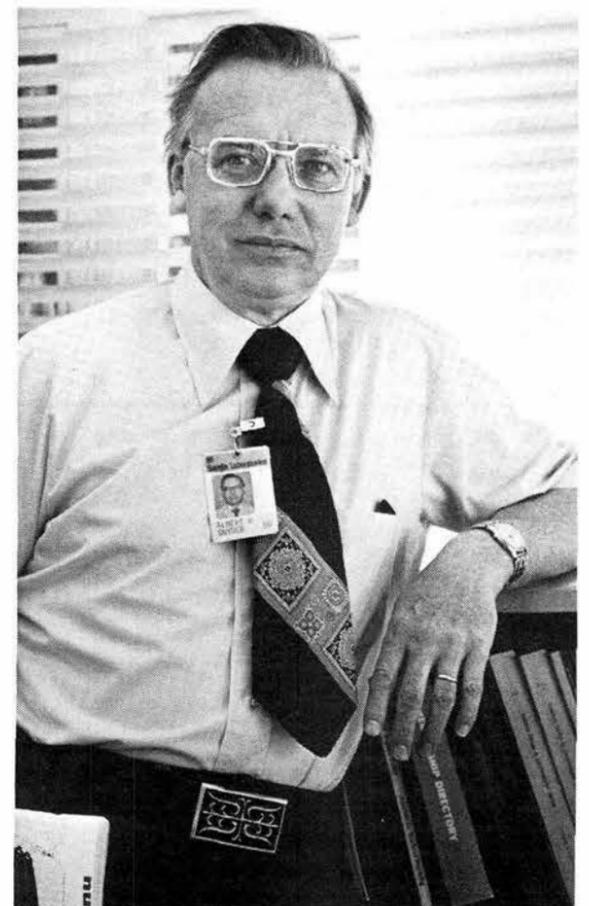
BILL SNYDER was appointed Director of Nuclear Fuel Cycle Programs 1800, effective June 16. The newly created directorate separates the nuclear fuel cycle programs (formerly Dept. 1720) from functions of the Nuclear Security Systems directorate; additional transfers and reorganizations will expand this new organization. Bill's responsibilities will include Lab activities relating to reactor safety, waste management, transportation,

and regulation of the commercial nuclear power fuel cycle.

After a stint of fundamental nuclear research at the AEC's accelerator lab in Ames, Iowa, Bill joined Sandia in December 1953. His earliest assignments included the planning of a radiation effects program and the development of nuclear facilities to simulate weapon effects. He has contributed to the design and management of the Sandia Engineering Reactor, the Sandia Pulse Reactor, Hermes I, Reba, and the Annular Core Pulse Reactor. His responsibilities have also included research on radiation effects and high temperature materials and participation and direction of field weapon effects tests. More recently, as manager of the Nuclear Fuel Cycle Programs Department, he has been especially active in developing new programs in the nuclear fuel cycle with ERDA and the Nuclear Regulatory Commission.

Bill earned his BS degree from Franklin and Marshall College in Lancaster, Pa., and his Masters degree from Iowa State University. During WWII he served two and a half years in the Navy, concerned with electronic systems. He is a member of the American Nuclear Society and the Institute of Electrical and Electronics Engineering, having served the latter as president of the Nuclear and Plasma Sciences Society.

His leisure time activities include skiing,



BILL SNYDER, director, Nuclear Fuel Cycle Programs 1800.

Sandia to Host Solar Symposium

Sandia Laboratories will host a two-day symposium on "Solar Total Energy Technology" on July 10 and 11. Purpose of the meeting is to bring together researchers, architects, architectural engineers, manufacturers and utility representatives to exchange information and ideas on solar systems and applications.

Bob Stromberg, supervisor of Solar Energy Systems Division 5717, and Al Skinrood, supervisor of Plowshare and Transducers Technology Division 8183, will discuss two Sandia Laboratories projects — the total solar community and various energy storage options.

flying, and "too many" home projects. Bill and his wife Ferne and children Schelley, Melanie, and Shannon live at 14201 Piedras Rd. NE.

Afterthoughts

Vitamin buffs, take note--"Vitamin toxicity is undoubtedly a more common malady than vitamin deficiency. The power of advertising is such that the public believes vitamin ingestion is the cure for almost anything, from baldness to lack of sleep. We see vitamin pills consumed like popcorn, with consequent gastrointestinal upsets and diarrhea... It is virtually impossible to convince the average patient that a healthy adult on even a mediocre diet does not need a vitamin supplement. And if you try to tell him that fatalities result from either Vitamin A or D in excessive amounts, he will think you're crazy.

And did you ever try to tell a young mother that her baby doesn't need vitamins? She won't believe you. If she doesn't change doctors, she'll go to the drugstore and buy some to give to the kid secretly...

Now one of the old ethical drug companies has leaped fearlessly into the breach and has produced a vitamin drop for infants that has very few vitamins in it. How appropriate! In an era when our money has no money in it, and people are paid for not working, it seems only logical to market a vitamin with almost no vitamins!" Dr. Don Coldsmith in Modern Medicine

* * *

More on the 79-million fatsos--One of the joys of editorship is the irate letter, especially the really wild specimen that is usually unsigned. Following our reference in the last issue about the newspaper article on Vietnamese refugees being located next to an item about 79,000,000 overweight Americans, we received a five-page blast, unsigned. In the spirit of equal time, we're quoting some of the more temperate passages: "Who counted the 'overweight' Americans? Do you always swallow propaganda so nicely? If there is any thought in that paragraph, it escapes us. It is part of a grim, determined campaign to make Americans feel guilty... 'Afterthoughts' is coyly subtle. It merely repeats the slander in a nice underhanded way. Why not come out and join the anvil chorus in the paean-- 'America stinks of gluttony.'"

That's not bad. The author of "coily subtle" has a real feel for the language. And when wishy-washy seems to be the prevailing literary theme, it's refreshing to come across some good, hard-core invective.

* * *

For undevelopers--"In bad roads is the preservation of the world." Joseph Wood Krutch. *js

Sympathy

To Emma Hollingsworth (4256) on the death of her brother in Ryan, Okla., June 19.

Herman Roser Heads ALO

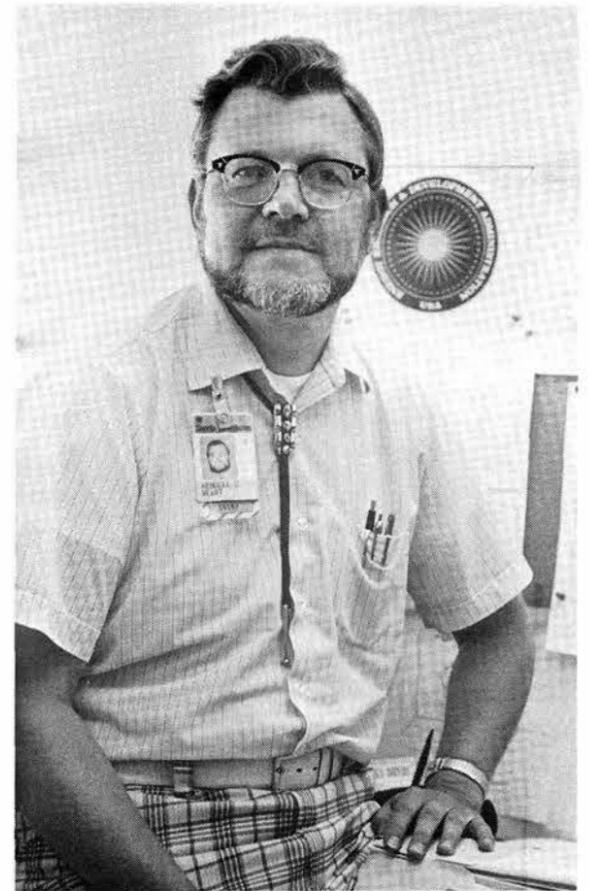
Herman Roser has been named Manager of ERDA's Albuquerque Operations Office. The appointment was announced by Robert Seamans, ERDA Administrator. Mr. Roser, who succeeds now-retired H.C. Donnelly, has been Deputy Manager since September 1972.



As manager, Mr. Roser directs field implementation of the Nation's nuclear weapons production program and of energy research and development programs at Sandia and LASL.

A native New Mexican, Mr. Roser joined the AEC at Los Alamos in 1961 as Assistant Area Manager for Community Affairs. He was Deputy Area Manager from 1964 to 1967, was named Area Manager in February 1967, and later became Assistant Director of DMA at AEC Headquarters.

Mr. Roser was born in San Marcial, N.M. and, except for his assignment in Washington, D.C., has spent all of his



WENDELL WEART, manager, Waste Management Systems Department 1140.

Supervisory Appointment

WENDELL WEART to manager, Waste Management Systems Department 1140, effective June 16. The new department brings together a group who will work toward development of a pilot radioactive waste storage facility (see LAB NEWS, May 30, 1975).

Wendell, a geophysicist, came to the Labs in 1959 from the Ballistics Research Lab at Aberdeen, Md. His early assignments at Sandia were concerned with ground motion and seismic phenomena arising from underground experiments. Since promotion to supervisor of Underground Physics Division in 1969, Wendell's work has focused on problems of containment of radioactive debris from underground detonations.

He earned a BA degree in geology and mathematics from Cornell College in Iowa and a PhD in geophysics from the University of Wisconsin. He serves as a member of the Sandia Classification Board and of several panels concerned with ground motion and containment at Nevada Test Site, where he is an alternate scientific advisor to the Manager as well. He holds membership in a number of technical societies dealing with geophysics and seismology.

Wendell enjoys gardening, bowling and an occasional tennis game. He and his wife Nancy Ruth have a son in college, and a son and daughter in high school. They live at 3401 Pitt NE.

Congratulations

To Mary Golden (5625) and George Kolesar (9622) on their marriage, June 6 in Albuquerque.

Mr. and Mrs. Kenyon Nowotny (2342), a son, Kevin Schofield, May 22.

working years in this state. He was graduated from Socorro High School, and has completed university courses in accounting, municipal public works administration, and in business law, as well as study with the Industrial College of the Armed Forces.

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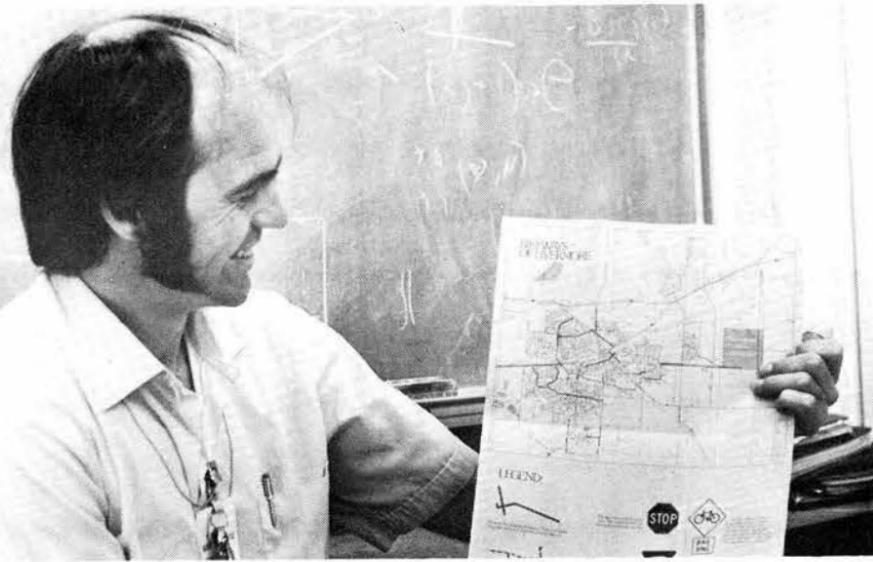
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john shunny is editor
&
don graham ass't. editor

bruce hawkinson & norma taylor write
bill laskar does picture work
gerse martinez lends a hand

&
lorena schneider reports on livermore

BIKERS KNOW where to go, thanks to this new brochure prepared by the Livermore Bikeways Association, headed by Chuck Hartwig (8342), and the Valley Spokesmen. Printed by the City, the brochure provides safety and maintenance tips as well as present and proposed bikeways, recommended routes. Copies are available in the lobby of Bldg. 911.



TWO STUDENTS from Chinle, Ariz., Mildred Shirley (left) and Charlotte Kahn, are at Sandia/Livermore for a month's exposure to computer programming and data processing operations in Systems Studies Department 8320. This internship program was developed under a Kellogg Foundation grant in cooperation with the Navajo Community College at Chinle, following Pres. Spark's visit to the school last fall. Both students plan to pursue a career in the computer field in college.

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LIVERMORE LABORATORIES

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Continued from Page One

Parachutes That Go Up

back. These give the chute a kind of kite effect — not efficient airfoils perhaps, but efficient enough to lift an 1100 kg (2400 pound) payload more than 30 meters above release altitude before the second stage takes over."

The primary advantage of a lifting parachute is that it allows a large second chute to be used — one which couldn't survive the shock of ejection from a fast-moving aircraft but which can slow down the payload enough to prevent damage upon impact. Tests show impact energy is one-tenth that of the conventional one-stage system. At the same time, the second chute can direct the payload almost straight down, an orientation which is preferable to the shallow impact angles characteristic of single-stage systems used at low release altitudes.

For the airfoil effect to work properly, the lifting chute's orientation must be generally upward during the first critical second after deployment. Sandia is developing a roll control system and will build it into the payload to assure proper orientation.

Authors

Rudy Johnson and Jack Dini (both 8312), "Beryllium Windows Joined by Electroplating," REVIEW OF SCIENTIFIC INSTRUMENTS, Vol. 46, No. 1

Larry Weirick (8312), "A Metallurgical Analysis of Stress-Corrosion Cracking of Kovar Package Leads," SOLID STATE TECHNOLOGY, Vol. 18, No. 3

Ron Musket (8334), "Proton-Induced Electron Emission from Characterized Niobium Surfaces," JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY, Vol. 12, p. 444

Death



Charles Shanabarger, a technical staff associate in Acceptance Technology Division 8344, died suddenly June 16. He was 59.

Chad had worked at Sandia since July 1959.

Survivors include his widow, a son and a daughter.

"Our biggest problem, once we settled on the slanted ribbon design," says Ray, "was to keep the lifting chute from collapsing as it began to take an angle of attack [that is, to begin lifting]. A series of wind tunnel tests indicated that lining the leading edge of the chute with a low porosity material and using the slanted ribbon design would prevent collapse. Drop tests proved we were right."

Arnie Rivenes (8158), supervisor in charge of the program, was Ray's co-worker when the concept was originally proposed. "His support and his technical contributions," Ray points out, "are key factors in the program's success."

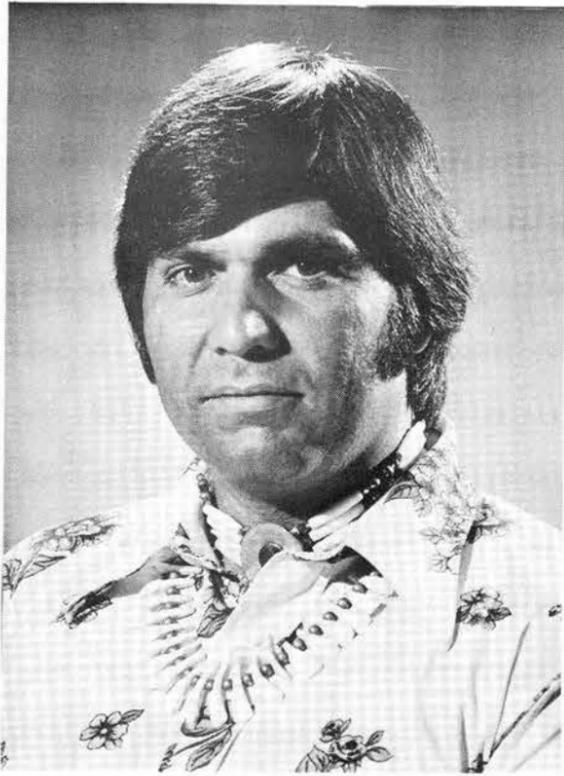
The lifting chute system's primary value is with payloads of munitions, mines, sensors, and other cargo dropped from low altitudes. Other applications may result from further study. •bh

Take Note

Mel LaGasca (8411) has been appointed to the Social Concerns Committee created recently by the Livermore City Council. Composed of citizens who have been active in various civic groups, the committee's responsibility is to advise the Council on the social needs, priorities and services of the community. The group is also looking at the design and use of the proposed low-income, multi-service center. Mel has been a member of Concerned Minority Citizens of Livermore (CMCL) for the past five years.



VISITOR — Director of Operational Safety Division of ERDA Headquarters, Martin Biles (left center), was at Sandia/Livermore recently. He is shown with (from left) Vice President Tom Cook (8000), George Anderson (8330), and Pat Gildea (8335) during a tour of the SLL tritium research laboratory.



AL ARTIAGA — Working with Affirmative Action Division 211.

New Staffer Joins Org. 200

Al Artiaga has joined the staff of the Affirmative Action Division 211 where he will assist in affirmative action programs and career counselling of on-roll employees. A Native American from New Mexico, he recently returned here from California.

Al has a bachelors degree in ethnic studies from Sonoma State College and a masters in psychology from Cal State. He has experience as an educational counsellor, has worked as a social service aide in California, and was a program director for the Intertribal Council in California. His more recent employment was as an IBM marketing sales representative.

Al is available to all employees for discussion or consultation in his office at the west end of Bldg. 832, Rm. 80, tel. 4-9481. Juan Abeita, also a Native American, will continue to share his time between Division 211 and his regular assignment in the drafting organization. Al will work closely with Juan, especially during his orientation to Sandia Labs.

Authors

H.J. Sutherland (5163), "Dispersion of Acoustic Waves by Fiber-Reinforced Viscoelastic Materials," Vol. 57, No. 4, JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA.

J.A. Halbleib and W.H. Vandevender (both 5223), "TIGER, a One-Dimensional, Multilayer Electron/Photon Monte Carlo Transport Code," Vol. 57, NUCLEAR SCIENCE ENGINEERING.

B. Stiefeld (9351), "NDT and the Ubiquitous Digital Computer," Vol. 3, No. 3, ASTM STANDARDIZATION NEWS.

T.D. Padrick (5215) and R.E. Palmer (5216), "Pressure Broadening of the Atomic Iodine $5^2P_{1/2} - 5^2P_{3/2}$ Transition," Vol. 62, No. 8, THE JOURNAL OF CHEMICAL PHYSICS.

H.J. Rack (5832), "Grain Boundary Embrittlement in a Beta Titanium Alloy," Vol. 6A, No. 4, METALLURGICAL TRANSACTIONS.

J.B. Gerardo (5210) and A.W. Johnson (5216), Comment on "Dynamic Model of High-Pressure Rare-Gas Excimer Lasers," Vol. 26, No. 10, APPLIED PHYSICS LETTERS.

J.C. Swearingen (5847) and J. Lipkin (5162), "Effect of Shock-Stress Structure and Hardness of Nickel, Chromel and Inconel," Vol. 19, No. 1, MATERIALS SCIENCE AND ENGINEERING.

For Gas Stimulation

Sandia will 'Map' Massive Hydrofracture Experiment

Sandia Laboratories will participate in early July in a massive hydrofracturing experiment to stimulate natural gas production in the Pinedale area of Wyoming. Vast reserves of the fuel are trapped in low permeability rock strata in a number of western states. The experiment aims at perfecting a technique to increase production of the valuable energy resource.

Hydrofracture, a standard method of the petroleum industry, consists of pumping fluids under high pressure into a well to create cracks in surrounding rock formations. The Pinedale experiment, to be conducted by El Paso Natural Gas Co., will attempt to create a fracture some five times larger than customary.

Hydrofracture is normally used in high permeability gas sands to enhance production. Gas at the Pinedale location is trapped in low permeability sandstone, and normal fracture techniques are not economically productive. Successful demonstration of massive hydrofracture at Pinedale could significantly increase the U.S. supply of natural gas.

Standard hydrofracturing produces cracks up to 500 feet in length; in the upcoming experiment, El Paso Natural Gas hopes to extend the cracks out to 2500 feet. Sandia will instrument the experiment to "map" the extent and orientation of the fracture to aid in experiment evaluation as well as to develop methods for optimized well placement for commercial operations.

To map the cracks, Sandia will install geophones in an extensive surface array and at the bottom of an adjacent water-filled well. A hydrophone will also be placed 5000-feet deep in this water well. The arrival time of seismic signals during fracture propagation

will be recorded, and from these signals location of the acoustic sources may be determined.

Limited experiments have previously been conducted using this technique.

In this experiment, Sandia will attempt to measure, at the surface, signals originating at 11,000 feet, the planned depth of the Pinedale hydrofracture. This represents a significant extension of the state-of-the-art.

A second measurement system, developed by Sandia, makes use of the fact that the hydrofracture fluid is conductive. The fracture well casing is initially used as a current probe. Electrical potential measurements at the surface will change as the fracture is developed. These changes in potentials voltages will be recorded by an array of instruments positioned at various distances around the surface of the fracture well. Data will be correlated by computer program and should indicate fracture orientations.

During the experiment, 440,000 gallons of fluid containing 600 tons of sand under 10,000 psi pressure will be pumped into the well over an eight-hour period.

The Sandia instrumentation program originated in Information Systems Department 1730 but is now centered in Geo Energy Technology Department 5730. Carl Schuster (5733) is program director, with Jack Hinde of Experimental Systems Division 1731 playing a major role. Mechanical Design and Test Assembly Division 9484 is also assisting the program.

The work is currently funded in FY 75 by ERDA for \$65,000; certain costs are borne by El Paso Natural Gas. It is anticipated that this effort will be expanded in FY 76.



MIT's Norman Rasmussen (at right) has tilted with Ralph Nader and countless others about "WASH-1400 Reactor Safety Study," the multivolume report whose preparation he directed. Prof. Rasmussen discussed the report at the Sandia colloquium last month. He's shown here with Sandia contributors (from left): Pete McGrath (1721), Stu Asselin (1724), George Merren (1222) and Alan Swain (1222). Sandians Jack Hickman (1233) and Hank Guttman (1222) also contributed. Asselin and Merren worked on the project for a year in Washington.

BRIEFING on Sandia's people, programs, and potentials was held for Michael Yarymovych, Assistant Administrator for Laboratory and Field Coordination, ERDA, last month. Here President Sparks discusses a microwave perimeter alarm head.



Recreation Notes

FUN & GAMES

Sandia Runners Ass'n. — The Southwest Masters Runners Club took off last week at its charter meeting. The Club, which aims at the 30-plus jogger/runner, elected Frank Collins president and Sandia's Pete Richards VP. Other Sandians elected as directors are Mark Percival (2411) and O.J. Foster (ret'd). Purpose of the club is to promote and encourage jogging and running for health and endurance, and a special effort is being made to attract the non-competitive runner. Pete Richards is developing a program for the club's first meet on July 12, which will be described in our next issue. SMRC already has some 50 members.

For you 1 and 2-milers out there, something to reflect upon: Otto Appenzeller, a late-40's MD from the UNM Med School, also a director of SMRC, described his latest fun-run to the group. It took place in Switzerland, distance 100 kilometers (62 miles), about 4000 entrants, and Otto finished 148th with a time of 10 hours, 38 minutes. That works out to about 10-minute miles — it also works out to about 2½ marathons.

Road Runners meet next Tuesday, July 1, at Rio Grande Park and the following Tuesday, July 8, at Albuquerque Academy. Time: 6:30 p.m.

* * *

Sandia Bicycle Ass'n. — If you're getting tired of pushing that 35-pounder around, Dick Hallett reports receipt of a shipment of the French Andre Bertin bike. These are high class machines, weighing 23 to 28 pounds and going for \$150 to \$300. Dick is at 2122 Coal Pl. SE. He also showed us a rather neat 6-sprocket free wheel, with which your 10-speed can become a 12-speed. Cost: \$20.

Thanks to Don Bliss, LAB NEWS now has a file of the two principal bicycling magazines, *Bike World* and *Bicycling*. The file goes back several years and, if you care to browse, you can find good technical articles on just about any phase of cycling. And if you say properly soothing words, we may just permit you to borrow individual copies. We have a similar file of *Runners World*.

* * *

Arts & Crafts & People — The 14th iteration of the Arts & Crafts Fair returns to the Fair Grounds this weekend, and if by chance there be some Albuquerquean not familiar with the event, well we doubt it. Jim Harris (2521) is Fair President this year, and

he informs us that 200 exhibitors will do their thing. Not to mention the 3-zillion visitors who, in their own way, are at least as entertaining as the exhibitors. The vaguely bohemian ambiance seems to bring to the surface the desire to appear rakish and/or wicked at least once in a while, and it's fun to sit on the grass watching the promenade. A & C is open tonight until 10, and opens Saturday and Sunday at 10 a.m. Cost: 50¢.

* * *

Coal smoke & other good things — The Cumbres & Toltec Scenic Railroad is running again this summer, on weekends and, in July and August, on Tuesdays and Wednesdays as well. This is a highly scenic run from Chama to Antonito, narrow gauge, steam locomotive, and if you don't get a cinder in your eye during the 60-mile run you get your money back. It's fun. We (LAB NEWS) have a supply of the C & T's brochures; call us if you want one (4-1053). Incidentally, the June issue of *New Mexico Magazine* is devoted largely to the subject of railroading in the state.

* * *

Sandia Gun Club — Sandia Labs members took seven awards in the recent NIRA (National Industrial Recreation Assn.) competition. Highest individual award went to Bill Stephenson (2411) who placed 19th nationally in the .22 pistol category. Three regional awards were also captured: Dave Overmier (9234), first in Precision Air Rifle; Ray Mosteller (1132), first place in Precision Air Pistol; and Dave Bennett (2513), second in .22 Pistol.

Overall the .22 pistol team took fourth place nationally, the precision air rifle team placed first in the region, and the precision air pistol team won second nationally.

THE DEDICATION of some of our scientific types never ceases to astound us. We caught this one in Bldg. 806 last week, working longer than he/she really had to. He/she wanted to pose for a Coronado Club pool photo, but we had to tell him/her the shot might be too revealing.



Take Note

Gloria Smith (9522/9523) has just returned from a vacation trip to several Asian countries and sends us two newspapers, *The Japan Times* and *The Times Journal* from Manila in the Philippines, both of which carry fairly lengthy stories about Sandia's hydrogen-fluoride laser (LAB NEWS, May 30). That's better treatment than we got from the local papers. Glancing through the Japanese paper, we noted one item that looked familiar: "Police Order Crackdown on Cyclists . . . In Okazaki Aichi Prefecture, 215 speed maniacs of 15 groups rampaged through the streets on their motorcycles, injuring five policemen. Police confirmed the existence of 817 groups, or 25,000 speed-crazy motorcyclists." Maybe they were protesting the helmet laws.

* * *

New Mexican landmarks and popular arts are featured in Maxwell Museum's current exhibit, titled "Roadrunner's Trail." Historic landmarks — archeological sites, churches, territorial forts and ghost towns — provide the backdrop for contemporary Hispanic and Indian arts and crafts. More than 400 pieces have been selected for the exhibition as representative of regional crafts.

Museum hours are Monday-Friday 9-4, Saturdays 10-4, Sunday 1-4. It is located at Roma and University NE on the UNM campus. There is no admission charge and parking is free and readily available on weekends.

* * *

Walt Von Riesemann (1544) was co-author of a paper selected by the ASME Pressure Vessels and Piping Division (PVP) Honors Committee for the PVP Literature Award. The paper, "Large Deflection Elastic-Plastic Dynamic Response of Stiffened Shells of Revolution," was presented at the PVP Conference in Miami Beach last year. Other authors are J.A. Stricklin and W.E. Haisler of Texas A & M University. The award was presented last week during the 2nd National Congress on Pressure Vessel and Piping Technology, in San Francisco.

* * *

The YWCA plans a Bicentennial Tour Sept. 13-29 to New England that includes a Great Lakes cruise and visits to Montreal and Quebec. Cost: around \$1500. If you're interested, call 247-8841 before July 10.

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SWEATERS BY DICK SIEBENFORCHER (4152) — Dick followed a traditional pattern for the ski sweater and the Irish fisherman's knit (both far left), and for the cardigan which he is wearing. The others are his own design.

Wombles, Syndicates & Bavins Found at Weapons Establishment

WANTED. Car-sharing syndicate, staff hours, Kempshott area, Ext. 4158.

Someone like George Bernard Shaw once observed that the greatest barrier to understanding between the United Kingdom and the United States was their sharing of a common language. That's a little overstated, but the classified ad above illustrates the point. It was taken from a delightful publication, AWRE News, with whom LAB NEWS exchanges papers.

AWRE stands for Atomic Weapons Research Establishment, and it is Britain's counterpart of Sandia, plus LASL and LLL. Located at Aldermaston, AWRE has had a working relationship with Sandia since the late 50's, and people from the two laboratories have exchanged visits many times.

Getting back to the *News*, the publication conveys, well, a British flavor — orderly, civil, a kind of reverence toward old things (and authority). No doubt that's stereotyping, but consider these excerpts from a recent issue:

(from an article on "factory bread")

"In the years between the Great Wars, a typical country or small town bakery would be operated either on a one-man basis or at the most four . . . the day's production always started the night before, as no baker worth his salt would make bread from dough which had not had 8 to 10 hours fermentation, unless forced by circumstances. To make a sack of dough took a good hour of hard work, after which the bavins or faggots of wood were put into the oven to be nicely dried out for firing the next morning.

"In the late 1920's and early 30's a typical oven full of bread would consist of 90% of cottage, coburg, and other open topped crusty loaf and the remainder of 'sandwich' loaves for the 'toffs.' A farm or forestry worker's lunch usually consisted of half a crusty loaf, with a lump of cheese, home-cured ham or home-made brawn, cut up on the spot with a large clasp knife. "For many families, bread in those days was a very important stomach filler . . . Nowadays it is merely a vehicle for something else, or to put something between two slices of, or something to help fill the dust bin. Which is about all some of it is fit for."

Amen.

(from Aldermaston News)

"Wombles were headline news over the Christmas holiday period because of the disappointment caused by some of the rather poor shows put on at some provincial theatres. But no one who saw the Womble display in the Medical waiting-room last Christmas could have had any feelings of disappointment . . ."

We haven't figured out the womble thing out yet. Not sure we want to.

(another article, "The Kennet and Avon Canal Restoration Progress")

"At the western end the top three locks of the Widcombe flight in Bath were formally worked through by the paddle vessel Jane Austen in September, after 22 years of dereliction . . ."

"This is a considerable achievement just two decades since the British Transport Commission tried to have the canal legally abandoned, destroyed forever, but now it is coming back to life to give pleasure to many thousands of boaters, walkers, anglers and nature lovers."

In this country we'd have paved it over.

Here's our favorite excerpt. It's from a sort of biography about Charles Harper, a man who wrote travel books. The time is the 1920's.

"Harper visited the United States (and) was impressed by the great buildings of New York, writing of the Woolworth Building, 750 feet in height. 'It is beautiful and so clear is the air of New York that it does not look that height' . . ."

Men's Lib

Don't Smoke — Knit

"About eight years ago, I quit smoking. Pacing the floor, hand wringing and climbing the walls gets old after awhile. The doctor's advice was to calm down. So I went out and bought some yarn and some sticks, a book, and taught myself to knit. And," explains Dick Siebenforcher, a cost analyst in Payroll and Cost Division 4152, "it worked — I learned to knit, I calmed down, and I discovered a great new hobby."

Dick admits that learning to knit wasn't simple. "I'm left-handed and instead of throwing the yarn over the needle with one finger in a neat, smooth movement, I was picking off stitches — some call it knit-picking. I had an awful time because the yarn kept falling off the needle." But with some help from friends and family, Dick finally got the knit-knack.

The results are impressive: capes, ski hats, afghans, and 30 sweaters. Dick has reached the point where he readily adjusts patterns to fit. He also designs his own patterns. He got the idea for a recent sweater from a billboard

advertising a ski area. The skier wore a sweater with a large snowflake design. Dick sketched a snowflake and later charted it on graph paper, worked out the stitches, and made the sweater.

Dick does much of his knitting at the Labs before work begins and during lunch. It takes him about three months to complete a sweater. His other activities don't allow much more time for knitting — square dancing (teaching and calling five nights a week), weight lifting (three times a week), skiing, and boating and water skiing.

"People sometimes give me a funny look, like the time I was waiting in the Denver airport. I'd made a sweater for a friend and it was too big. I figured it might fit my brother-in-law, and I took it along when I went to visit. It was too large for him. So while I waited for the plane I decided to unravel the sweater and start over. Well, I got some funny looks but I just kept unraveling and winding yarn and smiling. I knew what I was doing even if others didn't." • nt

Events Calendar

June 27-29 — Old Town Studio, "Last of the Red Hot Lovers," 242-4602.
June 27-29, July 4-5 — Albuquerque Civic Light Opera, "The Sound of Music," 8:15 p.m., Sun. 2:15 p.m., Popejoy Hall.
June 27-29 — Annual New Mexico Arts & Crafts Fair: 12-10 p.m., State Fairgrounds.
June 28 — Channel 5, "A Civil Rights Retrospective," 8 p.m.
June 29 — NM Mt. Club, Hamilton Mesa, 6 miles, Gulf Mart, 7:30 a.m.
June 29 — KHFM (98.3), Opera of the Week, Wagner's "Tristan Und Isolde," 6:40 p.m.
June 30 — Lecture Under the Stars: "Beyond the Myths of Marriage," 8 p.m., Central Mall.
July 2, 5 — Santa Fe Opera: "Carmen," 9 p.m.

July 3 — Channel 5, Cecil Williams, "Reach Out & Touch," 7 p.m.
July 3-20 — Adobe Theater, "That Championship Season" by Jason Miller, 8:30 p.m. Thurs. through Sun., 898-3323.
July 4-6 — NM Mt. Club, Brazos Cliffs, climbing weekend along the Brazos River, Petersen, 294-1044.
July 4, 9 — Santa Fe Opera: "Falstaff," 9 p.m.
July 5 — NM Jr. Olympic Championships for Track, Wilson Stadium.
July 6 — Open House at Old Cienega Village Museum, 18th Century Spanish Colonial Ranch.
July 7 — Lecture under The Stars: "Witchcraft on the Rio Grande," 8 p.m., Central Mall.

Speakers

S.T. Picraux (5111), "Studies of Hydrogen in Metals," Chalk River Nuclear Laboratories, May 12, Chalk River, Ontario, Canada.

J.W. Poukey (5241), "Effects of Ions on Relativistic Electron Beam Diodes," Symposium on Electron, Ion and Photon Beam Technology, IEEE, May 21-23, Colorado Springs.

G.W. Arnold (5112), Invited Paper, "Ion Implantation in Oxides," Workshop on Defects in Magnesium Oxide and Related Materials, NSF, May 26-28, Canton, N.C.

J.E. Kennedy and J.W. Nunziato (both 5131), "Behavior of Acceleration Waves in a Mechanical Mixture"; B.M. Bulmer (5628), "Hypersonic Base Pressure Measurements in High-Altitude Laminar Cone Wakes"; A.B. Donaldson (2515), "Analysis of Incompressible Flow Through Porous Media"; Donaldson, "Series Solution of Steady One-Dimensional Thermal Explosion Problems"; Donaldson and W.P. Schimmel (1543), "Investigation of Electrostatic Cooling by Laser Holographic Interferometry"; T.A. Duffey (1541), "Transient Response of an Elastic-Plastic Fluid Surrounded Shell," CANCAM 75—Fifth Canadian Congress of Applied Mechanics, University of New Brunswick, May 26-30, Fredericton, N.B. Canada.

E.P. EerNisse (5112), Invited Paper, "Quartz Resonator Frequency Shifts Arising from Electrode Stress"; P.D. Wilcox and G.S. Snow (both 2521), "A New Metal to Ceramic Seal for Flat Pack Quartz Resonator Enclosures," Annual Frequency Control Symposium, U.S. Army Electronics Technology & Devices Lab, May 28-30, Atlantic City, N.J.

J.B. Gerardo (5210), "Electron-Beam-Driven High-Power Hydrogen Fluoride Lasers"; A.W. Johnson, F.W. Bingham and J.K. Rice (all 5216), "Lasing at 5578.5 Å in E-Beam Excited Kr/O₂ Mixtures"; P.J. Hargin and M.M. Robertson (both 2441), "A Dye Laser Spectrometer for the Analysis of Pulsed Vacuum Arcs," '75 IEEE/OSA Conference on Laser Engineering and Applications, May 28-30, Washington, D.C.

M.J. Clauser (5241), "Charged Particle Beam Fusion," Colloquium at Argonne National Laboratory, May 19, Argonne, Ill.

C.F. Melius (5211), "The User of Ab Initio Effective Potentials in Molecular Quantum Mechanics," Stanford Research Institute Seminar, May 23, Palo Alto, Calif.

M.A. Duguay (5214), "Discussion of Soft X-ray Lasers Pumped by Photoionization," ARPA Special Seminar, May 27, Naval Research Laboratory, Washington, D.C.; and University of Quebec special seminar, (invited talk) June 4, Varennes, Montreal, Canada.

A.B. Donaldson (2515) and W.P. Schimmel (1543), "Theory for In-Situ Thermal Diffusivity Measurement of Thin Films by a Radial Heat Flow Method"; Schimmel and Donaldson, "Visualization of Free Convective Flow Views Using the Technique of Laser Holometry"; R.C. Heckman (5842), "A Sensitivity Analysis of Pulse Thermal Diffusivity Measurements," International Conference on Thermal Conductivity, June 2-4, University of Connecticut, Storrs, Conn.

P.J. Fielbelman (5151), "Surface Electronic Structure Information from Bulk Plasmon Photoexcitation in Free-Electron-Metal Films"; H.H. Madden (5114), "Threshold Measurements in Electron Stimulated Desorption: Oxygen on Nickel," Annual Physical Electronics Conference, June 2-4, Penn. State Univ., University Park, Pa.

J.R. Freeman (5241) and S.L. Thompson (5166), "Two-Dimensional MHD Modeling of Compressed Magnetic Field Generators," Conference on Numerical Simulation of Plasmas, Courant Institute, June 2-4, New York City.

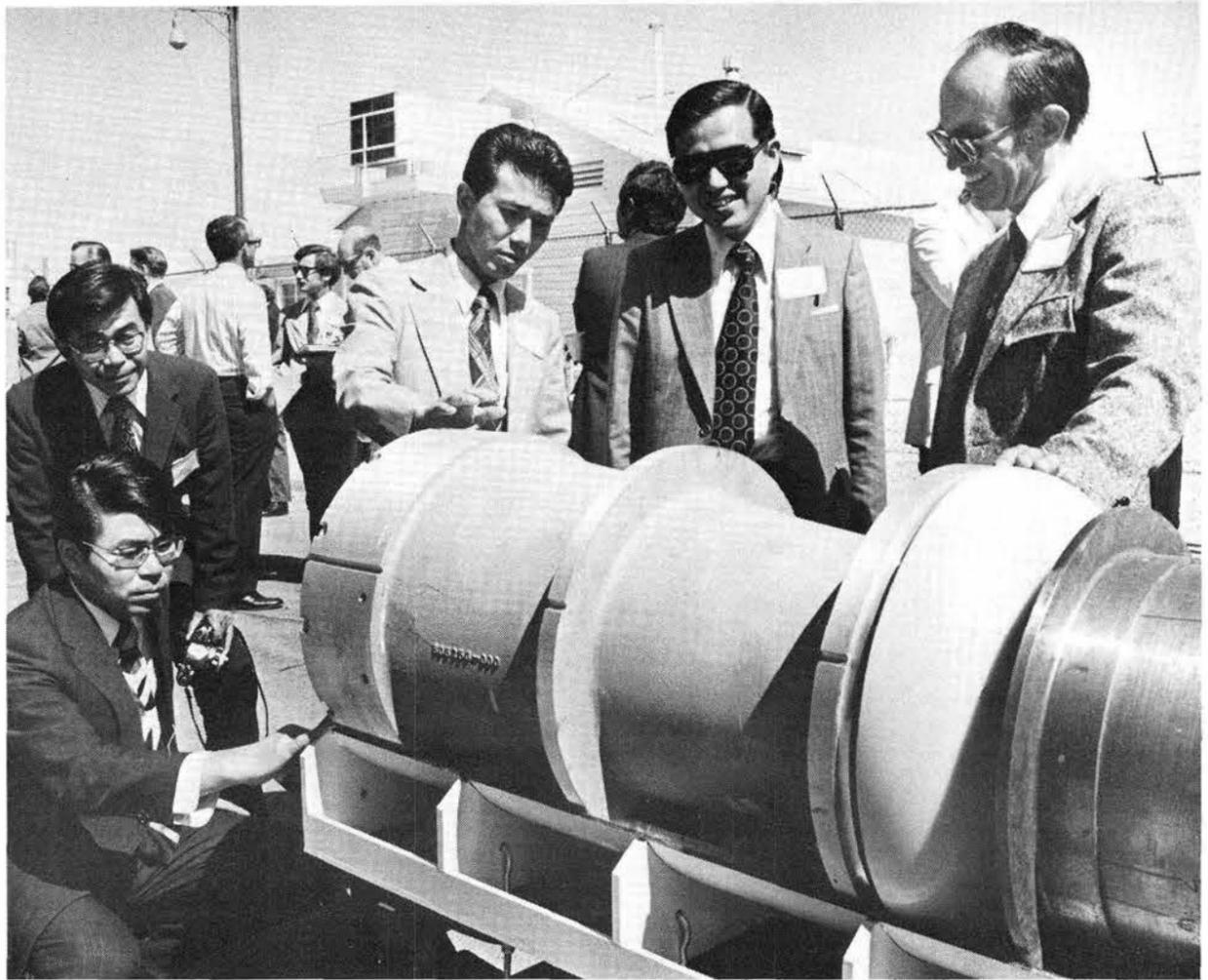
H.J. Sutherland (5163), "Stress Wave Propagation in a RTV Rubber," Joint Meeting of U.S.-Japan Societies of Rheology, June 3-6, Honolulu, Hawaii.

R.C. Heckman and R.M. Elrick (both 5842), "Errors in Push Rod Dilatometry Deriving from Thermal Sources," International Symposium on Thermal Expansion of Solids, June 4-6, Storrs, Conn.

R.G. Kepler (5810), "Electronic Properties of Organic Molecular Crystals," Great Lakes Regional Meeting, Organic Solid State Chemistry, June 4-6, St. Paul, Minn.

P.J. Chen (5131), "Wave Propagation in Piezoelectric Materials: Theory and Experiments," Colloquia on Modern Topics in Mechanics, Northwestern Univ., June 6, Evanston, Ill.

G.A. Carlson (5167), "First-Wall Protection Concepts for an Electron Beam Fusion Reactor"; D.A. McArthur (5225), T.R. Schmidt (5222), P.B. Tollefrud (5220A), and J.S. Philbin (5221), "On High Energy (~1 MJ) Nuclear Driven Gas Laser Systems"; D. Jensen (2413), "Pulsed Neutron Logging for In-Situ Assay of Uranium Boreholes"; T.O. Hunter (1133), "Vacuum Pumping Considerations for Electron Beam Fusion



THEY came from all over to attend the ERDA Safeguards Briefing, including this group from Japan shown here with Walt Joseph of Transportation Division 1713. More than 200 members of industry concerned with nuclear materials management attended sessions here, at LASL, and in New Orleans, where the 16th annual meeting of the Institute of Nuclear Materials Management is being held. Walt describes this item as "adaptive hardware for a payload for shipment in accident resistant container."

Reactors"; J.C. Conant, J.S. Philbin, J.A. Snyder (all 5221) and W.H. Sullivan (2112), "New Instrumentation and Control System for Fast Burst Reactors"; J.R. Wayland, L.D. Chapman (both 4734), and R.G. Cuddihy (ITRI), "Dynamic System Analysis of the Environmental Impact of a LMFBR Program"; S.G. Varnado (4739), "Power Balance Considerations in Electron-Beam-Induced Fusion Power Plants"; T.A. Sellers (1739) and J.J. de Montmollin (1730A), "Development of Advanced System Concepts for Material Protection," American Nuclear Society annual meeting, June 8-13, New Orleans, La.

R.C. Hughes (5814), "Electron and Hole Transport in sub script 2," Dept. of Physics, UCLA, June 9, Los Angeles.

P.C. Lysne (5131) and C.M. Percival (2411), "Analysis of Shock-Wave-Actuated Ferroelectric Power Supplies"; J.O. Harris (2521), "Compositional Dependence of Electrical and Electrooptic Characteristics of X/65/35 PLZT Ceramics for X from 8.0 to 10.0"; R.A. Graham (5131), "Pressure Dependence of the Piezoelectric Polarization of Lithium Niobate and Lithium Tantalate"; G.R. Laguna (2521), "PLZT Linear Array Page Composer"; G.A. Samara (5130) and J.C. Holste and W.N. Lawless (NBS, Boulder), "Dielectric Properties of KH₂PO₄, BaTiO₃, PZT (65/35) and TICl Between 0.015 and 10K," IEEE Symposium on the Applications of Ferroelectrics (SAF), June 9-11, Albuquerque.

J.W. Reed (5644), "Wind Climatology," Second Wind Energy Conversion System (WECS) Workshop, June 9-11, Washington, D.C.

R.P. Clark and R.W. Rehinhardt (both 2523), "Phase Diagram for the Ternary System CaCl₂-KCl-CaCrO₄," 1975 NATAS Conference, June 9-11, Peterborough, Ontario, Canada.

L.F. Shampine (5121), "Local Error Control in Codes for Ordinary Differential Equations"; H.A. Watts (2642) and L.F. Shampine, "The Art of Writing a Runge-Kutta Code: RKF45," SIAM 1975 National Meeting, June 9-11, Troy, N.Y.

D.E. McGovern (1712), "An Investigation of Supervisory Control of Remote Manipulation," Remotely Manned Systems Conference, June 9-11, Cal. Tech.

A.W. Johnson (5216), "Problems in the Production of High-Power Vacuum-Violet Lasers," IV Vavilov Conference on Nonlinear Optics, June 10-13; and "Electron-Beam-Excited High-Power Gas Lasers," Second All-Union Symposium on Gas Laser Physics, June 16-18, Institute of Spectroscopy, Academy of Sciences, Novosibirsk, USSR.

L.E. Horner (9512), "Qualities of Leadership," Westpoint H.S. Leadership Awards Dinner, April 22, KAFB (East) Officers Club.

T.W. Moody (2433), "A New Method of Current Transformer Loading"; C.M. Tapp (2430), "Physical Limitations of Hybrid Microcircuit Materials," 25th

Annual Electronic Components Conference, May 12-14, Washington, D.C.

R.A. Holloway (9623), "Conversion to the Metric System," May 8, Valley High School math class.

N.J. DeLollis (4813), "Metrication and International Standards," May 8, Valley High School math class.

G.C. McDonald (9623), "Backpacking," May 8, Freedom High School class.

H.C. Monteith (9344), "ESP Research in Russia, England and America," May 9, Freedom High School class; and "The Human Aura as Seen by the Ancients," May 12, McKinley Jr. High School class.

R.P. Stromberg (5717), "Solar Energy," May 10, N.M. Western University.

H.H. Patterson (1730), "Alaska and the Arctic," May 16, Rio Grande Lions Club.

B.W. Marshall (5717), "Solar Energy," May 27, Community School class.

R.L. Simpson (2411), "Electronics As A Profession," TV-I electronics classes, June 5.

W.S. Saric (5641), "Stability of Liquid Films on Transpiration-Cooled Reentry Vehicles, Part I: Supersonic Flows," AIAA 8th Fluid and Plasma Dynamics Conference, June 16-18, Hartford, Conn.

G.C. Nelson (5825), "The Analysis of Solid Surfaces by Low Energy Ion Scattering Spectroscopy," 19th National Colloid Symposium, June 16, 18, Clarkson College of Technology, Potsdam, N.Y.

J.A. Panitz (5114), "Surface and Near Surface Characterization by Imaging. Field Desorption Mass Spectrometry," APS Meeting, June 16-18, Knoxville, Tenn.

W.R. Wawersik (5163), "Triaxial Compression Experiments on Jointed Rock," Annual meeting of the American Geophysical Union, June 16-20, Washington, D.C.

ENERGY SAVINGS

COMPARED WITH USAGE IN BASE PERIOD - JULY 1972 THRU JUNE 1973
CURRENT REPORTING PERIOD ENDING MAY '75

ELECTRICITY	BASE PERIOD 84789 MWH 1975 66832 MWH 21.4% SAVED
STEAM PLANT FUEL EQUIV. OIL	BASE PERIOD 209210 BBLs 1975 183297 BBLs 12.4% SAVED
VEHICLE MILES	BASE PERIOD 2,293,000 MI. 1975 1,718,000 MI. 25.1% SAVED

MILEPOSTS

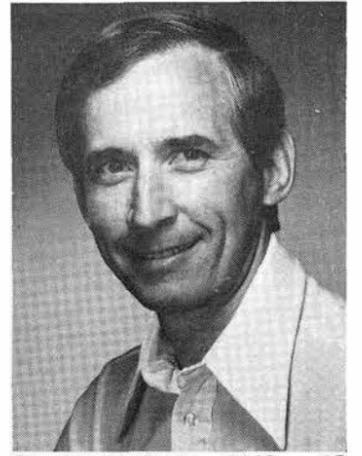
LAB NEWS

June 1975



Ruth Barth - 3155

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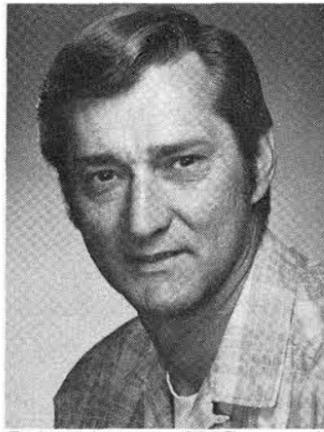
Charles McCarty - 2112

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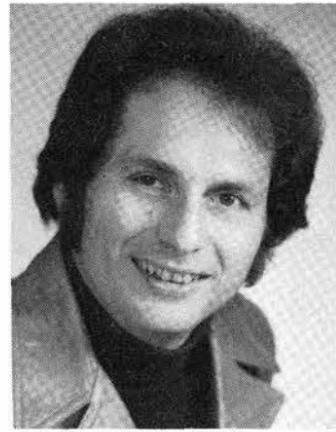
Ruth Jones - 9510

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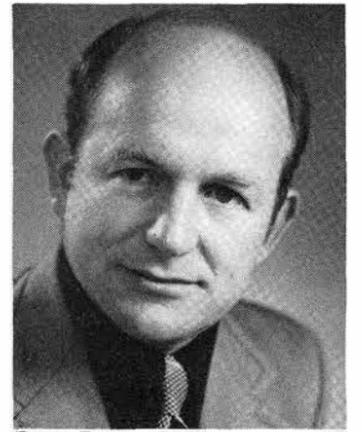
Robert Lucas - 9322

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Jim Dremalas - 8432

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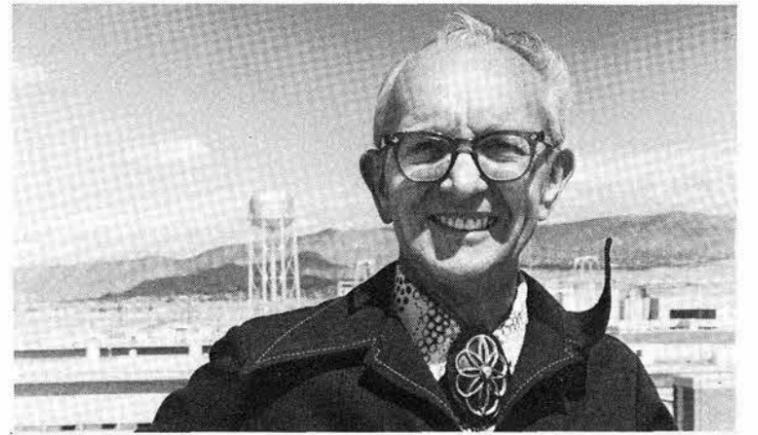
Dave Bray - 8182

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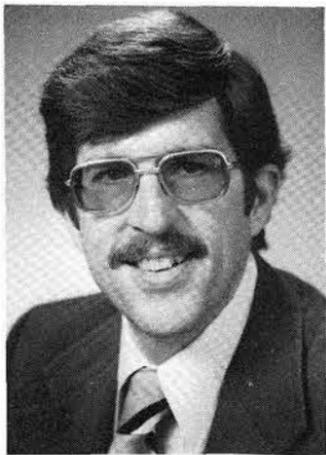
Bill Shurtleff - 9344

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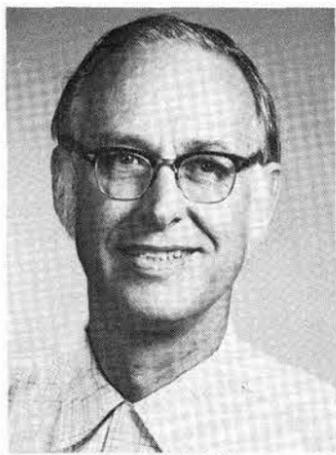
Dean Irvin - 4210

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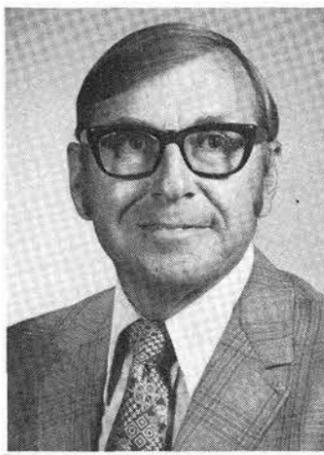
Jay Gilson - 8366

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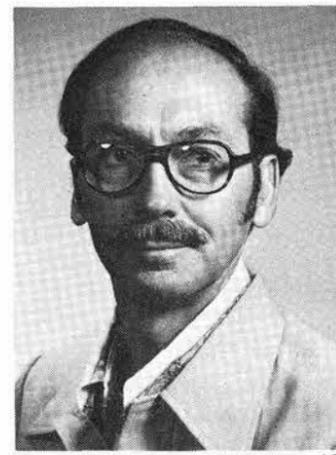
George Steck - 5122

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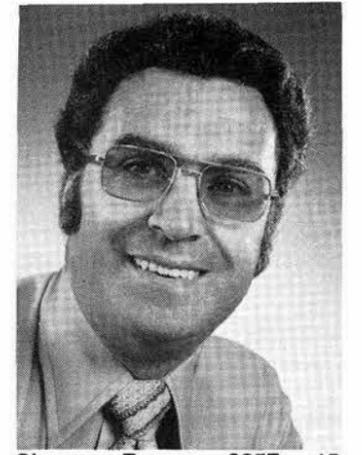
Dave Bickel - 9322

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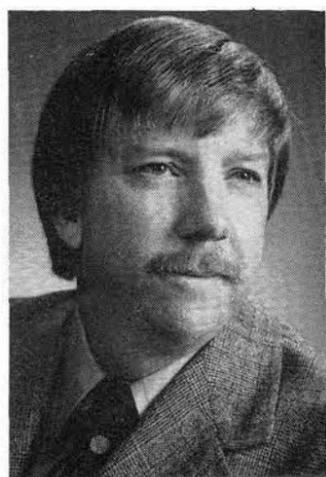
Kenneth Ream - 2442

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Clarence Rogers - 8257

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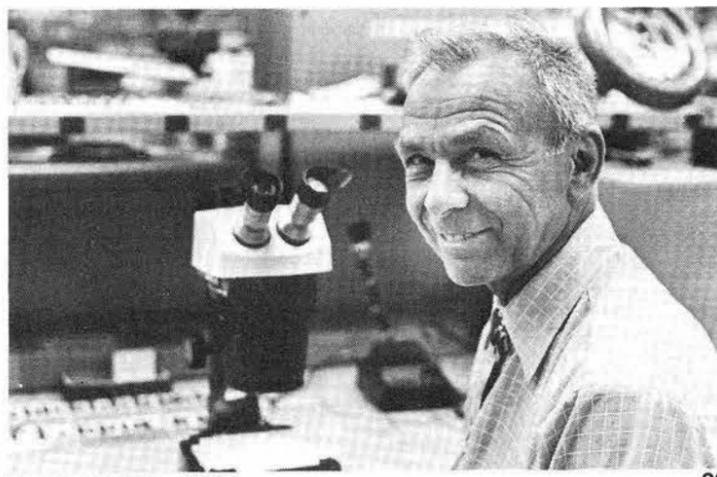
Glenn Smith - 8432

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Aldred Stevens - 5167

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George Volda - 2434

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Curt Franklin - 8163

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Ruth Johnson - 9743

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Leo Scully - 9474

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Nemesio Martinez - 4821

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Warren Arthur - 9718

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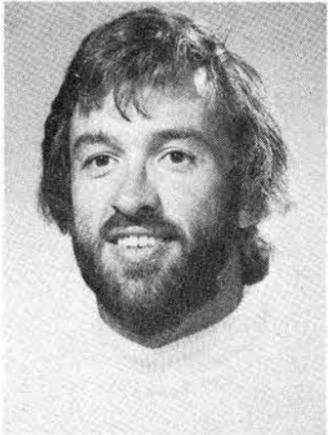
Arlo Nord - 1541

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Bob Cox - 4122

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William Saric - 5641

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Leslie Shope - 2414

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James McDowell - 2111

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Manuel Vallejos - 9713

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Frank Tufts - 9752

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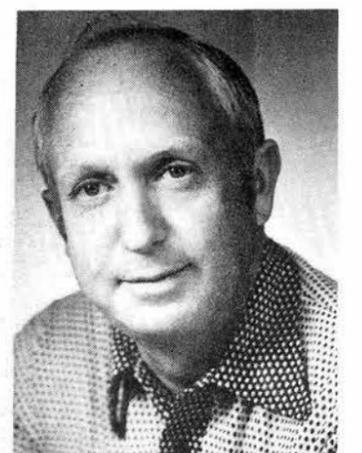
Norbert Siska - 2317

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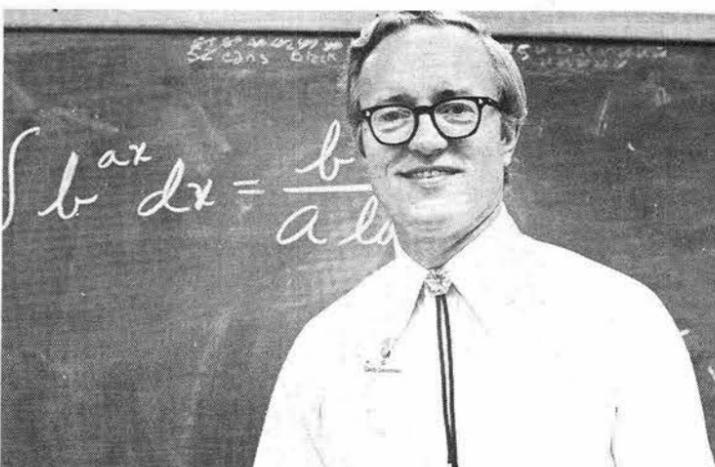
Errol EerNisse - 5112

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Jerry Slusser - 1132

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Leo Klamerus - 2434

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David Ryerson - 1252

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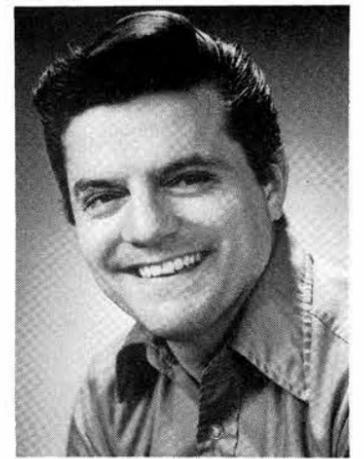
Leroy Brase - 2522

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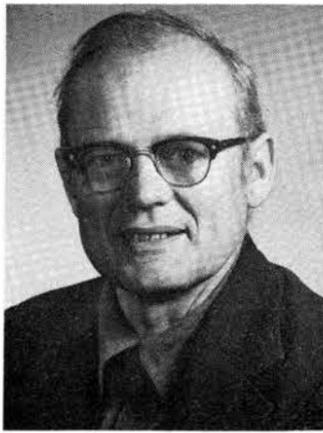
Donald Anderson - 9471

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Jim Reitz - 8424

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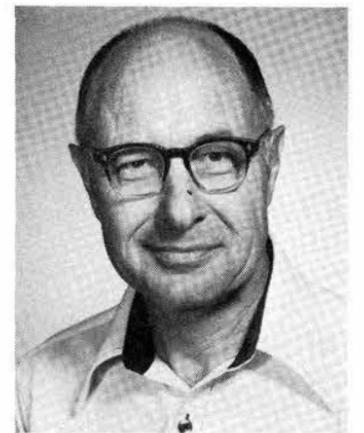
Robert Altherr - 3621

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Robert Parks - 4276

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Ken Cordes - 1254

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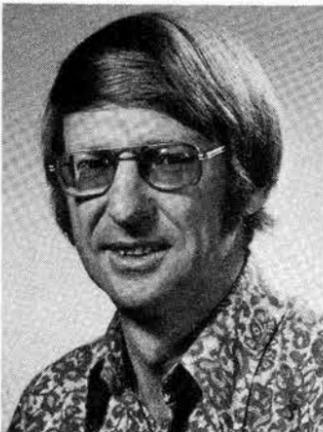
David Caskey - 1115

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Anthony Russo - 5644

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William Riggan - 2411

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Richard Ashmore - 2325

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Alfred Giddings - 2322

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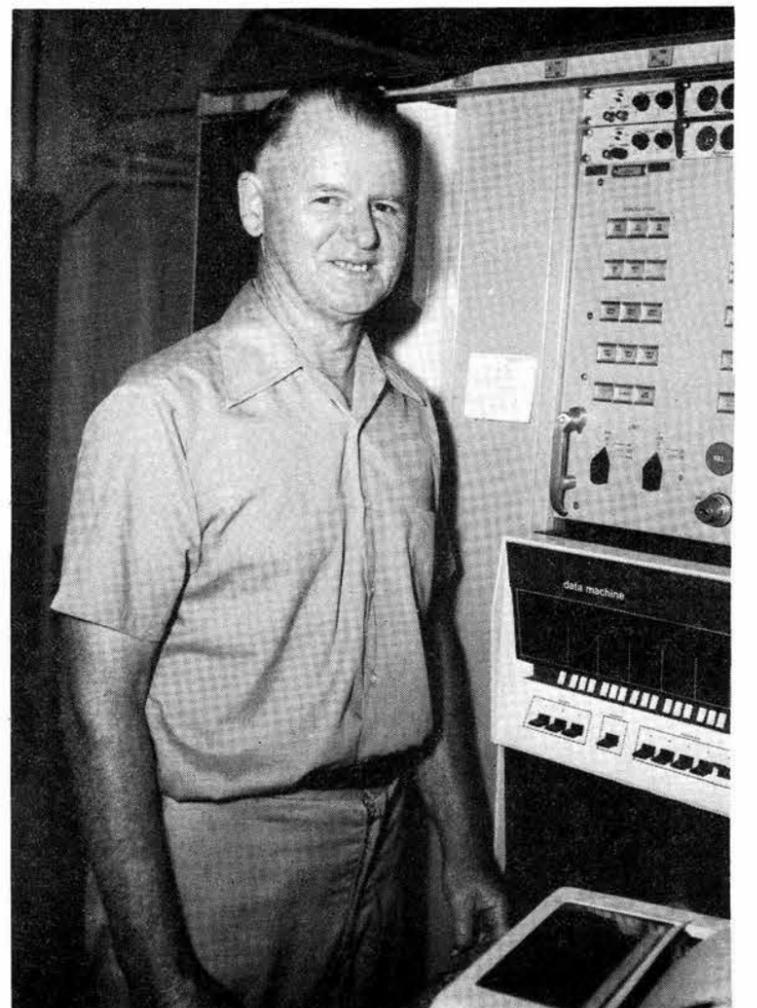
George Elliott - 4251

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Gordon McClure - 2412

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Donald Cole - 9524

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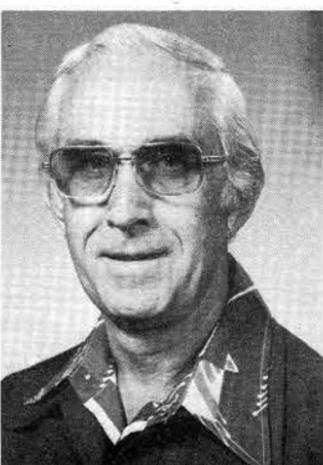


Richard Roy - 8365

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Duwayne Branscombe, 2133,15



Eldon Frame - 9521

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Q. The SLA telephone book is a mess. I'm so far behind stuffing new pages in I would have to spend a day just bringing it up to date. Every time I turn my head there is five pounds more to insert. Please consider either a return to the reprinted book of fond memory or at least let us catch up by a complete up-to-date reissue. (From SLL)

A. The loose-leaf binder version of the telephone directory allows us to keep up with our frequent organization changes on a relatively current basis — significant organization changes are issued as soon as information is available; other changes may be issued monthly. The "reprinted book of fond memory" was frequently out-of-date by the time it was printed and distributed and represented a substantially higher publication cost than the current method. We can't see justification for the cost of a total reissue at this point since we understand most books are updated as soon as new pages are issued. It may be of some interest for you to know that the comment we receive most frequently is that we don't issue update pages often enough.

K.A. Smith — 3100

A comment:

Many bike riders using the north gate have the habit of driving through the Bell Gas service station just outside the gate. This occurs morning and night. We who purchase

(Ed. Note — The writer is correct about driving through the gas station, but off base about using the street. The "sidewalk" between the Wyoming gate and the gas station is an official bikeway and is the recommended route. Vehicles exiting from the gas station should yield the right of way to on coming vehicles — including bicycles.)

feed back

gas there are continually taking evasive action to avoid hitting them.

I think they should be informed that this is a dangerous habit and aggravating to the car drivers. The street or sidewalk should be used; they have no right to be on the station property. And when using the street or sidewalk, they should have the courtesy to give the driver the right-of-way when he is exiting.

Q. Is there any locker-room facility available to Sandia employees who would like to run to work in the morning & shower, before 8:00? The base gymnasium doesn't seem to welcome Sandians these days.

A. Several members of the Sandia Runners Association shower in the locker room located near the sheet metal shop in Building 841. I understand, however, that most of these men try to get there about 7 a.m. so that they do not interfere with the shop people coming to work at 7:30.

There are also showers near the plastics shop, Building 834, and in Building 887.

R.E. Hopper — 9700

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5. For Sandia Laboratories and ERDA employees only.
6. No commercial ads, please.
7. Include name, and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

YARD SALE: Sat. June 28, 8:30 to 2:30 at 10205 Matthew NE, baked goods, arts & crafts, misc. items. Romero, 821-5116.

COZY gas floor furnace, hourly btu input 50,000, hourly output 35,000, model #15, \$50. Pitti, 344-0203 or 256-1629.

'72 **STARCRAFT** alum. boat, 18', 140 hp Merc cruiser, large wheeled trailer w/Buddy bearings. Klein, 294-0888.

17.1 **CU. FT.** refrig., gold, Kenmore, 2-door, frostless freezer, \$200. Brennessel, 256-1412.

BATHROOM sink, \$15; 4-track tape deck, 2-speakers, 12 tapes, \$15. Pope, 255-6702.

DIVAN & love seat, brown tweed, \$75; gold overstuffed chair, \$40; dinette table with 4 chairs, \$35. Duvall, 255-4678 after 5.

GERMAN automatics, Ortgies Erfurt, 7.65 cal., \$35; Rhoner Sportwaffenfabrik gas pistol, 6.35 cal., \$18; want old knives. Smitha, 293-1177.

'72 **TERRY** Travel trailer, 26 ft., 6 gal. water heater, 7 ft. gas/electric refrig., forced air heat, awning, tape deck, full bath. Krueger, 298-8361.

UTILITY trailer, 6'6" x 20'6", welded metal frame, carpeted plywood flat bed w/large tool box, heavy duty axle & tires, licensed, VanSickle, 296-1657.

CARL SANDBURG'S

Abraham Lincoln books, 6 volumes, the 2 Prairie Years, the 4 War Years, first volume personally autographed by Sandburg, \$50. Robertson, 255-6707.

REGISTERED AKC Springer Spaniel, male, 1 yr. old, has already been hunted, training still in progress, \$125 or offer. Bolton, 265-5444.

SOFA, 3-piece sectional, rose/pink, curved section, \$85. Ussery, 296-0175.

GARAGE SALE: Sat. June 28, 12320 Kinley NE, furniture, appliances, clothes, nuts & bolts, linens, you name it, we got it. Syme, 293-9735.

AIRTRAVELERS Flying Club Membership, Cessna 172, \$700. Anderson, 294-5236.

GOATS, mother & 3 kids. Robinson, 865-5224.

CAMPER, pickup 8 1/2' cab-over, '65 Open Road, sleeps 4. Meyer, 296-9066.

DINETTE set, table w/leaf & 4 chairs. Collier, 265-6823.

GE TOP freezer refrig., new compressor & overhaul 2 yrs. ago. Olson, 268-5312.

METAL file cabinet, file in top, has 6 drawers, \$10; clamp-on desk lamp, \$10. Rowe, 296-6295.

SOFA, colonial, \$50; love seat, colonial, \$50; 2 end tables, \$25 ea. Troyer, 298-3092.

POWER MOWER, Craftsman, 18 in., reel type with 3 hp engine & grass catcher, \$40. Laskar, 299-1024.

HEADER & muffler for VW type-111, fits squareback & fastback, get better mileage & still retain heater collector, \$25. Souther, 842-9630.

AIRPLANE, share in Mooney MK20-A, 2 radios, ELT, EGT, Xpndr, IFR certified, 650 SCMOH, hangered, clean. Elliott, 256-7909.

POTTED house plants, 50¢ and up. Miller, 268-5992.

MATTRESS & matching box springs, dbl. bed size, \$25. Matlack, 256-7371.

SAILBOAT, 13', lg. open hull, seats 2, 88 sq. ft. dacron sail, easily cartopped; 1.7 HP outboard motor. Kroth, 293-9565.

REG. 3-yr-old grey half Arabian mare, 14 hands, sound & spirited, \$500. Lambert, 344-9012.

FIBERGLASS SCREENS w/alum. frames, 4 ea., size: 18" x 23 1/2" @ \$1.50 and 24" x 31 1/2" @ \$1.75. Glaser, 293-8110.

ORGANS: Hammond N-300 w/Rhythm II and portable Lowrey w/Leslie speaker. Perino, 821-3331.

VW SKI RACKS, \$9.50 & \$7; used Sears steel radial tires, 195 x 14, \$5 ea. Novotny, 296-7167.

HP-21 calculator, \$110, 25-yr-award. Howerton, 299-6409.

16' MFG SKI BOAT w/90HP Evinrude outboard motor, canopy, stern & side covers, \$1350. Sinnott, 299-1300.

DINETTE SET, 7-pc. oak-grained top, mottled hues of wine & bronze, wrought iron trim, tubular steel frame, \$70. Gutierrez, 821-4512.

SIDE VIEW MIRRORS for late model (chrome) pickup. Gonzales, 265-2671.

TRANSPORTATION

'69 **AUSTIN** Healey Sprite convertible, \$900. Pope, 255-6702.

'61 **CHRYSLER** New Yorker, \$250. Bill, 242-3087.

'67 **LAND ROVER** 4x4, new tires, Warn hubs, \$1700. Hamilton, 281-3763.

'73 **PLYMOUTH** Duster, gold w/white vinyl top, AT, R & H, 4 new tires, 6-cyl. Charley, 293-5020.

10-**SPD.** bicycle, used 1 mo., \$48. Johnson, 255-0262.

'72 **BMW** Bavaria, 26,000 miles, AM/FM radio, good tires, air, \$6350. Nunez, 247-2877 or 268-3605.

'67 **PLYMOUTH** Barracuda, AT, AC, R&H, 273 V8, 74,000 miles, \$750. Smith, 266-8175.

'67 **BUICK** Skylark, 2-dr. hardtop, AT, AC, PB, PS, radio, General Dual-90 tires, white interior, \$650. Bassett, 898-1840.

'68 **PLYMOUTH** wagon, 383 V8, all the extras, 63,000 miles, \$450. McVey, 299-1994.

'70 **TORINO** GT, low mileage, just painted & tuned. Prevender, 299-5253.

'71 **FORD** SW, fully equipped, low mileage, lug. rack, radial tires, vinyl interior, \$500 down, \$100/mo, no interest; Chevy truck seat. Browne, 881-3772.

FORD Econoline van converted to camper, 53,000 miles, engine & brakes overhauled. Miller, 281-3189 evenings or weekends.

'62 **FORD** P.U., 1/2 ton, LWB, aux. tank, \$475. Ashworth, 296-9126.

'59 **T-Bird**, restored, lt. blue, st. stick, R&H; '74 VW bug, gold, st. stick, R&H, snow tires. Chacon, 294-0065.

FOR RENT

REDECORATED unfurnished, 2-bdr. apt., appliances, carpeted, drapes, washer/dryer hook ups, all utilities paid, \$170, lease for less, vicinity Menaul & Morris NE. Duvall, 255-4678 after 5.

LEASE, new 3-bdr. house, 2-bath, 1750 ft., garage, fenced yard, fp, carpeted, laundry/sewing room, 1112 La Charles NE, \$350/mo. Moody, 821-1128.

APARTMENT, new 1-bdr., unfurn., private patio, walk-in closet, frost free refrig., AC, 541 Espanola SE. Aragon, 242-1651 or 255-7338.

REAL ESTATE

3-BDR. HOME, UNM area, fp, lg. DR, new elec. kitchen, dbl. garage, low 30s, terms flexible. Duvall, 255-4678 after 5.

3-BDR., 1 3/4 bath, rose &

rock garden, blue spruce in front yard, established neighborhood. Gonzales, 881-0825.

5 ACRES, part hill, part level, County road, electricity, terms. Pearlman, 299-6079.

MOSSMAN, 3300 sq. ft., 5-bdr., FR, rec. room, fp, landscaped, sprinklers, lg. covered patio, quiet neighborhood. Bryson, 296-3846.

WANTED

FEMALE ROOMMATE, own room, NE heights, Knighton, 294-8983 after 6.

BUILDING camper/travel home; need plans for cab-over construction; also need pickup or van in running condition (body no problem), cheap. Watterberg, 883-0586.

B-17 FLYERS & CREWMEN who flew in the great war, for LAB NEWS article. Call John 4-1053.

FULL SIZE mechanics tool chest. Roth, 877-4997.

SOLAR ENERGY: Persons building or interested in building solar heated homes & establishing information exchange call Jay Pearlman, 299-6079.

HOUSE SITTING AVAILABLE: We (3) need a place to live, July 15 - Aug. 15. Boes, 256-0166.

PAIR of skis for children. Harris, 255-6577.

COMPETENT RIDER desires to rent good horse, one week starting around July 25; no tack or equipment needed. Causey, 881-7534.

LOST AND FOUND

LOST — Silver twist bracelet; Man's tinted glasses; Man's silver rim bi-focal w/case; Bike chain & lock.

FOUND — Man's black rim Rx glasses; Man's black rim sunglasses w/black case; Man's brown rim bi-focal glasses. **LOST AND FOUND**, Bldg. 832, 4-3441.

MERRY-THON • C-CLUB • DENNY • INK SPOTS • SOL CHAVEZ • BAHAMAS • SOUL

FRIDAY	SATURDAY
27 — HAPPY HOUR HAM BUFFET Adults \$2.95 Under 12 1.95 Denny On Stage SOL CHAVEZ & THE DUKE CITY BRASS	28 — SOUL SESSION TRUCKIN' 8:30-12:30 Members Free Guests \$1
4 — OF JULY! FAMILY PICNIC Swim 11-6 Lunch \$1.25 Games & Prizes @ 2 All Day Happy Hour	5 — CLUB OPEN For Private Recuperation Parties

COWBOYS — would feel right at home off the range when Sol Chavez brings his longhorns (and short ones) in for a brassy, sassy Happy Hour on the 27th. But cowboys would be a mite displeased because Sol doesn't do Rose of San Antone-type music. Settle for Sunflower of Santa Fe or any of the less-Texas favorites, and you'll have a great time. Actually, Sol's music is so middle-of-the-road he gets side(men)-swiped — really listenable/danceable. Denny and his Genuine Guitar plus his degree from Famous Musicians Correspondence School too to listen to whilst you sup.

GET — to the Session Saturday (the 28th) with Truckin' — a mean machine featurin' sockin' rock and soulin' roll. Don't be afreight to come on out for the big rig gig, dig?

THEIR — cares abandoned, their sorrows forgotten, the signers-up-soon for either of the trips coming up will wing their way to happiness next fall. One trip takes C-Clubbers and guests to the Nassau Beach Hotel in the Bahamas Oct. 28 - Nov. 4 for \$545. See the teaser film at 7 on the 8th. The other puts members in Mazatlan (also known as C-Club South) Nov. 1 - 8 for \$259. Sign up the week of July 7.

HIPS — hips, hoorays (plural for lots) for the Monday through Sunday (July 21-27)



AMONG THE MANY attractions at the Big Fourth of July celebration is a doubles horseshoe pitching tournmanet — amateurs or experts, mixed or matched (40-foot throw). Here, Jean Romero (ERDA) and Dan Craig (5226) polish their pitching and posing skills. More info from Bob Schuch at 4-2676.

attractions of the Club's 25th Merry-thon Birthday Celebration. Relive the jitterbuggy 50's, ogle the sports stars (Unserpassed delight), chomp the birthday cake, applaud the celebrated dignitaries (or, if you prefer, the dignified celebrities), curse the sound of "Bingo?" (if it's shouted by someone else), thrill to Denny's Six Magic Strings and Five Recalcitrant Fingers, enjoy the shrimp peel (we've hired a midget ecdysiast), and soak up the Ink Spots. And there's more! Later.

CHAPPED — cheeks and sunburned thighs, baked baldspots and shaded eyes: offer your body once more to the sun god in observing the nation's 199th on the 4th. And do it at the Club. The above plus the Seven-point-six Trombones of the Municipal Band, games, prizes, hot dogs, horseshoes, beer, and, of course, natatorial activities. This is your last chance for a Glorious Fourth; next year, with inflation, it'll be the Fifth.

MORE INFO — 265-6791.

SHRIMP • BINGO • LONG HORNS • GAMES • HAM

Thieves to Be Snared by Transparent Scheme

A clear plastic similar to that used for bread wrappers is being investigated by a Sandia Laboratories scientist because of its possible use in a system to help prevent theft of nuclear materials.

The plastic — polyvinylidene flouride — generates a voltage when it is subjected to pressure or temperature changes. It might be possible to coat floors, walls, ceilings, etc., with thin films of the material and, with appropriate sensors and circuitry, to use the pressure- or temperature-induced electrical signal to detect intruders.

The Labs is not currently developing an intrusion detection system based on the material, but is investigating the material's basic properties.

Glen Kepler, manager of the Organic Materials Research and Development Department 5810, is conducting the investigation. Glen is primarily interested in determining whether the material's ability to produce an electrical signal will degrade with time. Good aging characteristics, together with the material's low cost, might make the plastic suitable for large area intrusion

detection systems for nuclear reactors and fuel processing plants.

The material is very sensitive, Glen notes, with the pressure of a footstep or a 1°C change in temperature sufficient to produce a detectable electrical signal. The material reverts to its normal state when the pressure or temperature change disappears.

The pressure and temperature sensitive properties of the film are induced by applying a large electric field while the film is held at temperatures of about 94°C.

As the result of a still unknown mechanism, application of heat and an electric field aligns the minute crystals within the film. When pressure is applied or temperature altered, the electric field produced by these crystals changes, thus producing the voltage.

At least two products which use the electrical properties of polyvinylidene flouride are already on the market. One is a set of high fidelity earphones that takes advantage of the piezoelectric properties of the material; the other is a sensitive heat detector that exploits its pyroelectric properties.

