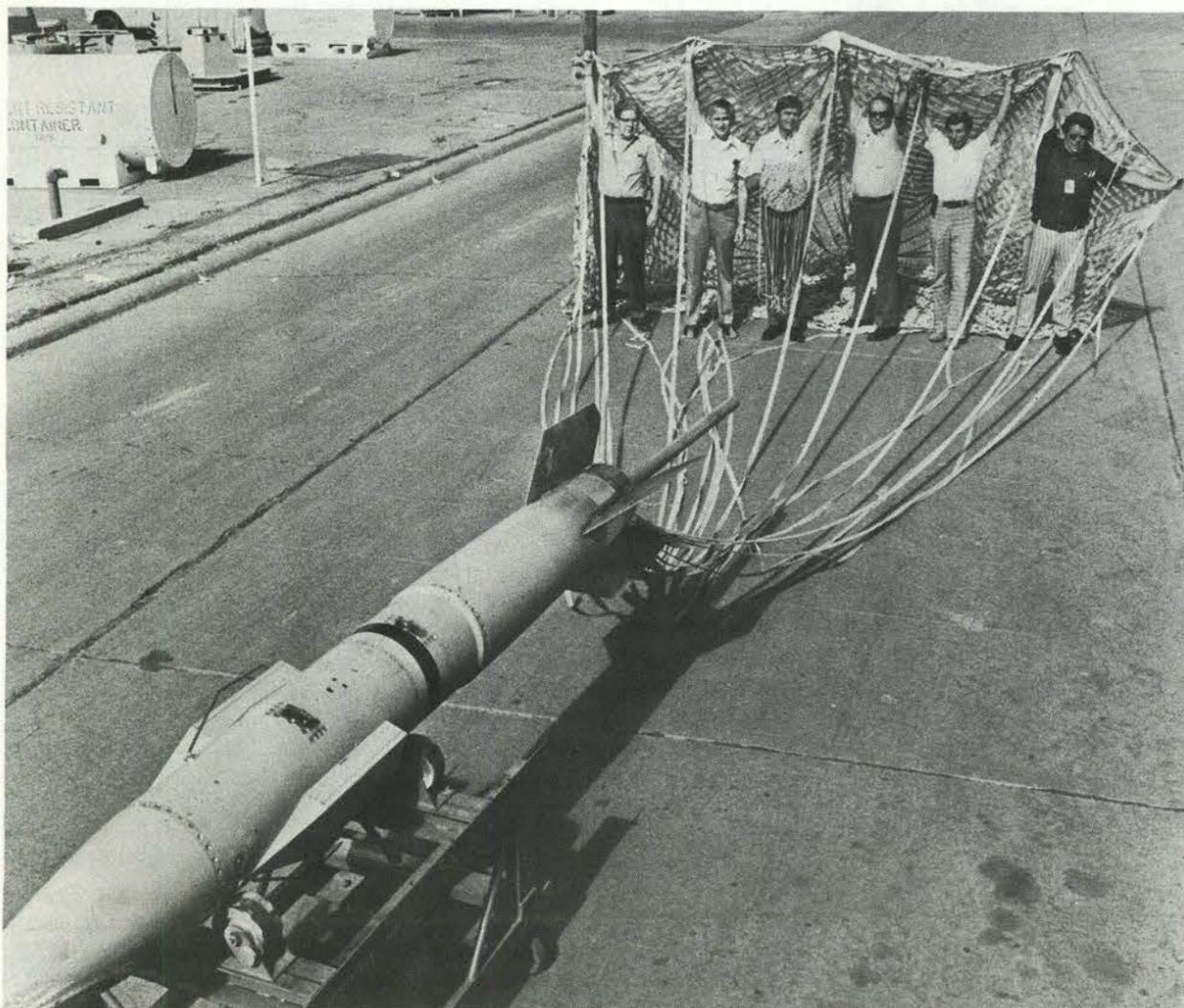


# LAB NEWS

VOL. 28, NO. 16

AUGUST 6, 1976

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



TEST UNIT and new Kevlar hybrid parachute design for the B61-3 weapon recently saw Mach 1.05 on a rocket sled in Area III. New 24-ft. diameter chute replaces a 17-ft. nylon chute of the same weight and volume, providing a better impact angle and a softer landing. From left are Oley Oleson (1332), packer; Bruce Ercole (9483), telemetry; Bill Pepper (1332), project engineer; Harold Widdows (1332), packing and rigging; Ernie Hall (1332), test vehicle; and Dennis Cronin (1332), packing and rigging.

## Saves Weight, Volume

# New Material Undergoing Test For Weapon Parachute Use

A series of recent tests in Area III and at Tonopah Test Range subjecting new parachute designs to velocities up to Mach 2.2 and loads more than 110,000 lbs. is proving the hard way the value of a new parachute material called Kevlar-29.

The synthetic fiber developed by Dupont is twice as strong as nylon, or stated another way, for half the weight and volume you get the same strength.

In the weapons business where every ounce of weight and every cubic inch of volume is extremely important, Kevlar is making a difference.

For instance, using Kevlar in the lifting parachute of the B77 bomb reduced the weight of the recovery system from 83 lbs. to 50 lbs. Kevlar is used for the suspension lines, radials, and the parachute skirt band. The canopy ribbons remain nylon because of its large strain-to-failure properties. It has more "stretch."

"Kevlar is tricky to sew," says Bill Pepper of Parachute Systems Division 1332. "It is very stiff fiber, and we are experimenting with

sewing and bonding methods. Sandia has a contract with Fabric Research Laboratories to investigate fabric weave and design and the joining problem. We've made considerable progress. Most of our tests so far have been successful."

Another program where Kevlar is making a difference is the B61-3 bomb. In a new parachute incorporating Kevlar, parachute size has been increased from 17-ft. diameter to 24-ft. diameter in the same weight and volume. The new parachute (a Kevlar/nylon hybrid) provides a greater impact angle and a softer landing for this lay-down weapon. Impact energy is reduced by about 60 percent. This new parachute successfully survived a 50,000 lb. loading during a recent Area III rocket sled launch at a Mach number of 1.05. Kevlar has also been used in the parachute bag in a new re-usable design.

As a part of a reimbursable for SAMSO with Division 1323, a small 19-inch diameter Kevlar parachute for use in ballistic missile nosecone recovery is being developed. This chute, made entirely of Kevlar, was tested on

(Continued on Page Five)

## Da Vinci III Successful



Herrington

Da Vinci III scientific balloon mission successfully tracked urban air pollutants from St. Louis across five states recently in a continuing study of the lower atmosphere.

New on the team of four on board the balloon's instrumented gondola was Preston Herrington of Instruments and Sensors Division 1735. Pres is project engineer for the Da Vinci program. Other on-board team members were Jimmie Craig, U.S. Naval Weapons Center; Vera Simons, project consultant; and Rudolf Engelman, NOAA.

After a 7:25 a.m. launch July 23, the balloon rose to an altitude of 1600 ft., later climbing to 7500 ft., and drifted in the same parcel of air to land some 24 hours and 25 minutes later near Morehead, Kentucky.

Measurements made on board the balloon provide insight into how gaseous effluents from urban, industrial and power production activities are transformed into more hazardous pollutants in the lower atmosphere.

"We were kept very, very busy operating the instrumentation for 20 different experiments on board the gondola," Pres says. "I had never been in a balloon before and it is a different kind of experience. Thunderstorms at night are super-impressive. So is the sight of the countryside drifting by, but we didn't have much time to enjoy the view."

Da Vinci III drifted about 450 miles from Arrowhead Airport near St. Louis over the center of the city (about a quarter mile north of the great stainless steel arch near the Mississippi) and continued on across Missouri, Illinois, Indiana, coming close to Cincinnati, Ohio, and finally landed in Kentucky. The balloon came to rest in a small clearing surrounded by trees. "A terrific landing," Pres says.

"It was not a joyride," he says. "Temperatures in the gondola during the day ran about 95° and, of course, there is no sensation of wind. Still, it was a unique experience and I'd do it again."

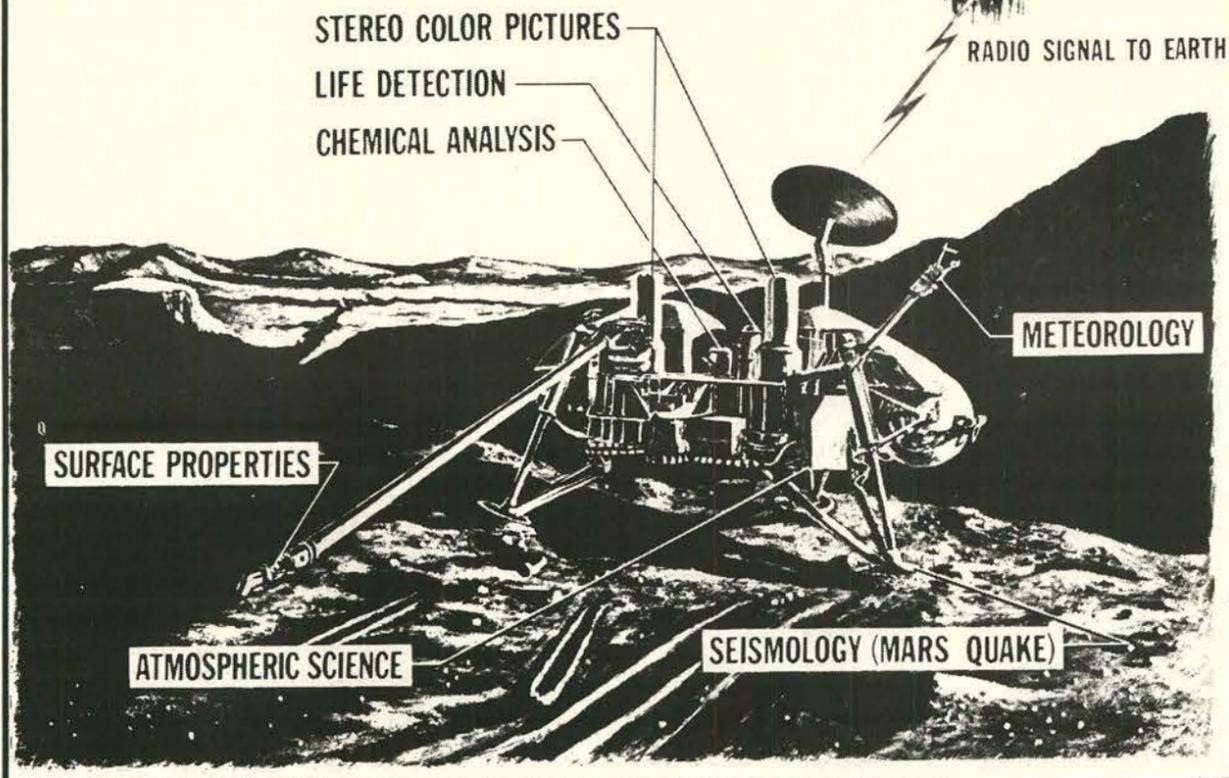
There will be a Da Vinci IV. Another balloon experiment is scheduled for the spring of 1977 but final plans will depend on the analysis of the data gathered during the first three Da Vinci flights.

Bernie Zak (5443) is project scientist for the Da Vinci program. Keith Smith is project director.



DRAMATIC DIFFERENCE in Kevlar and nylon is demonstrated by Bill Pepper (1332). Top nylon strap is twice as thick and heavy as bottom Kevlar strap. Both have a minimum breaking strength of 20,000 lbs.

DRAWING shows Viking spacecraft on surface of Mars performing a complex set of scientific experiments. The Viking is powered by two radioisotopic thermal generators built by Teledyne Energy Systems. Sandia's Division 9512 performed the quality assurance functions — determining that hardware met design specifications — for the Viking mission.



## Alan Pope at JPL for Mars Landing Event

Alan Pope (1400) was "there" when the Viking I lander landed on Mars on July 20. He talked with us about the experience:



"The Jet Propulsion Laboratory near Pasadena was the place to be for the landing. I had two meetings on the West Coast anyway, so it was easy for me to accept NASA's invitation to visit mission control at JPL.

"I must admit that getting up at 3 a.m. wasn't particularly easy, but I made it to JPL about 4. We were among a bunch of people moving somewhat nervously around a large room containing three TV sets.

"Mission control told us that at that moment the lander had separated from the orbiter and was hurtling toward Mars at about 16,000 miles per hour.

"The attitude was tense — with radio commands taking 19 minutes to get to Mars, it was too late to make last minute corrections now.

"By 4:53 we were watching mission control on the sets. The lander had slowed to a few thousand miles per hour. At 5:10:06 it deployed its parachute and dropped its heat shield. Twenty seconds later it deployed its landing feet. At 5:11:08 the chute was cut loose, and 1.2 seconds later the retrorockets came on.

"By now the crowd was very, very tense — a few nervous giggles, otherwise silence.

"But then, at 5:11:49.8, we heard a breathless 'Touchdown . . . we have touchdown on Mars.' Pandemonium then, but not the kind you get for a home run. It was mostly cheers of relief, tempered by knowing that it wasn't over yet. Lots of handshaking and mutual congratulations. One fellow got up, walked over to a table and just stood there, staring at the table. Others couldn't cheer until *their* gadget worked, and that might be days.

"The first pictures came in at 5:47 and showed unweathered rocks and some dust on the one visible landing foot. The second panoramic camera gave us a view similar to a New Mexico arroyo — small rocks all around, but no large ones close by. A landing a hundred yards away could have hit the edge of the arroyo and tumbled the lander.

"Yes, it was a thrill to be there — it's not every day that you get to look at Mars."

### RTG's Producing 80 Watts

## Sandia QA Men Proud of Viking

With every achievement of the Viking spacecraft on Mars — detailed color and black/white photography, meteorological reporting, surface analysis, and the complex steps required in the search for life — men of Electronics and Electrical Devices Division 9512 under Bill Thomas add another notch to their already perfect record. (See LAB NEWS, June 11, 1976.)

None of the scientific experiments of the Viking lander would be possible without the power produced by two radioisotopic thermal generators (RTG's) on board the spacecraft. Division 9512 performed the quality assurance function in accepting the RTG's from the manufacturer, Teledyne Energy Systems.

"Quality Assurance is the verification that the hardware meets specifications," says Bob

Harnar, project engineer. "Virtually all RTG parts were inspected by Sandia against system requirements and specifications. The work is carefully documented during all phases of fabrication, inspection, testing and acceptance. This kind of attention to detail probably accounts for our 100 percent success rate."

Since 1966, Sandia has performed the QA function for all RTG units for space applications (and some terrestrial applications).

An RTG incorporates a radioactive source (the Viking RTG's use about 7 lbs. of plutonium 238 each) and converts the heat directly to electrical power without moving parts.

During the first six days on Mars, the RTG's averaged a combined power output of 77.7 to 80.5 watts. Average operating temperature (the "hot side" of the thermocouples) of the RTG's was about 1000°F while outside temperatures on the Mars surface ranged from -27°F to -123°F. Surprisingly, wind velocities of more than four miles per hour have not been measured. More wind and dust were expected.

Design life of the RTG's is 90 days. They weigh 32 pounds each in a compact package 18 inches high and 22 inches in diameter.

The second Viking spacecraft is scheduled to land on Mars Sept. 4.

In the meantime, work continues in Division 9512 on two RTG development programs for future Jupiter, Saturn and Uranus fly-bys in addition to RTG's for terrestrial applications.

## LAB NEWS

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### SANDIA LABORATORIES

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so does russ smith  
&

loreana schneider reports on livermore

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## Blood Donors Needed

Blood Services of New Mexico, a not-for-profit community blood center, serves the needs of 43 hospitals throughout New Mexico. Help is needed.

According to Don Keller, donor coordinator, Blood Services supplies 3000 pints of blood each month, but demands are going up. He cites as one factor increased usage from an average of 10 patients per week undergoing open heart surgery and requiring up to 150 pints each. A few years ago, open heart surgery was not performed in the state.

More than 400 Sandians now contribute regularly to Blood Services. New employees on roll are urged to join in the effort.

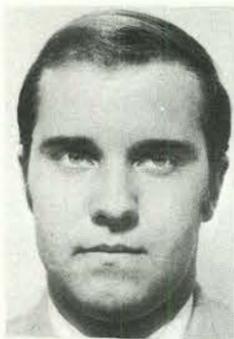
Donations are taken every Tuesday from 8 a.m. to 3 p.m. at KAFB hospital, room 54. A shuttle bus provided by Blood Services departs from Personnel Bldg. 832 every 20 minutes on Tuesdays. If you can help, call Vern Henning (4213), 4-7336.

## Death

Steve Swisher, an Engineering and Science Assistant in Telemetry and Instrumentation Systems Division 8183, died July 20 in Hanover, Pa., after a long illness.

He had worked at Sandia/Livermore since September 1969.

Survivors include his mother, father, sister and brother.



## Authors

Rand German (8312), "Particle Size Influence on the Strength Relation for Air Sintered Aluminum," METALLURGICAL TRANSACTIONS, Vol. 6A, pp. 1964-5.

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Charles Schooler (8336), "An Optimal Tracking Filter for Systems with Modeling Inaccuracies," IEEE TRANSACTIONS, AE -11, No. 6.

Rand German (8312) and Z.A. Munir (UC/Davis), "The Geometry of Sintering Wires," JOURNAL OF MATERIALS SCIENCE, Vol. 10, pp. 1719-24.

Charles Bisson (8332), Bill Wilson (8341) and R.A. Johnson (Univ. Virginia), "Volume Expansion Due to Substitutional and Interstitial Helium Atoms in bcc Metals," RADIATION EFFECTS, Vol. 25, pp. 155-56.

Bill Wilson (8341) and Charles Bisson (8322), "Migration of Copper Divacancies in the Presence of Helium," RADIATION EFFECTS, Vol. 25, pp. 197-99.

Pete Mattern (8334), Larry Watkins (8159) and Cliff Skoog and Ed Barsis (both 8342), "Absorption Induced in Optical Waveguides by Pulsed Electrons as a Function of Temperature, Low Dose Rate Gamma and Beta Rays, and 14 MeV Neutrons," IEEE TRANSACTIONS, NS-22, No. 6, pp. 2468-2474.

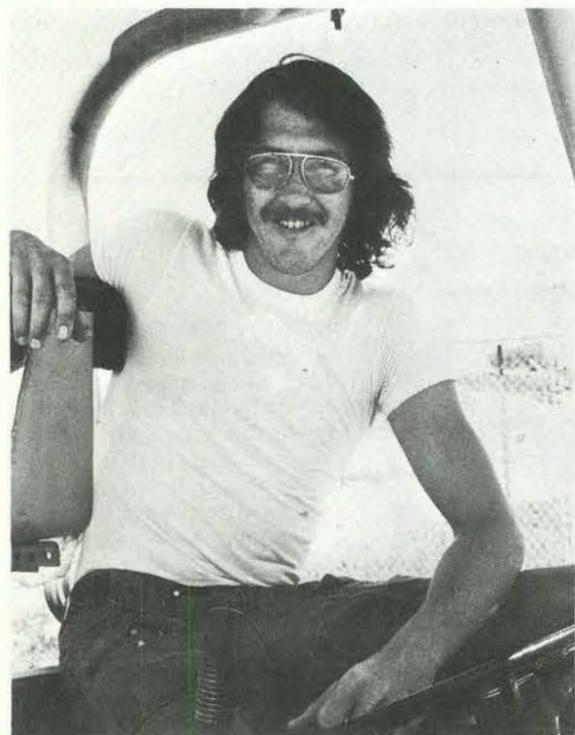
Jim Shelby (8334), "Helium Migration in Borogermanate Glasses," JOURNAL OF APPLIED PHYSICS, Vol. 46, No. 10 pp. 4510-14.

## Sympathy

To Len Bedinger (8254) on the death of his eldest son in Walnut Creek, Calif., July 10.

To Bob Humphrey (8158) on the death of his father in Concord, Calif., July 8.

To Verne Ivins (8423) on the death of his father in Aberdeen, Md., July 9.



**APPRENTICE GRADUATES** — Plant Technician (Structural) Rocky Bouscal (8257) recently completed SLL's apprenticeship program which included five years of on-the-job training and related academic courses.



**SLL WORK/STUDY SPONSORSHIP RECIPIENTS** — Students working at Sandia Livermore this summer before attending college this fall under Sandia's Work/Study Program are Jeff Anderson of Livermore, UC/Davis, electrical engineering major; Linda Tashima of Tracy who recently received the Bank of America Liberal Arts Award, UC/Davis, chemical engineering; Richard Ford of Livermore, UC/Davis, bio-chemistry; and Rebecca Gonzales of Tracy who will be continuing her work in chemistry at Stanford University, her second year in the program. Training and Benefits Division 8214 administers the program.

# LIVERMORE NEWS

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LIVERMORE LABORATORIES

AUGUST 6, 1976

## Bell System TV Seminar at SLL

A recent Bell System Corporate Television Seminar held at Sandia/Livermore was the first conducted by AT&T in the western part of the country. Headquarters and field personnel exchanged video production, engineering and administrative experiences and discussed the latest in television technology and techniques.

Seminar participants included representatives from TV related organizations at AT&T and WE corporate headquarters in New York, in addition to Long Lines/San Francisco, WE Pacific Region, PT&T, and Sandia. VP Tom Cook (8000) greeted the participants at the seminar luncheon; other speakers were John Rhame, Director of

Advertising and Information at WE headquarters, and Dick O'Meara, Manager CCTV Operations, AT&T headquarters.

A highlight of the first day was a tour of SLL's multi-channel educational TV center. Later, Kenneth Down, Assistant Dean of Engineering at Stanford University and Director of the University's Instructional TV Network, discussed Stanford's ETV system, its broad scope of programming, and its link with Sandia. He also described the formation of a new nationwide consortium of university video networks.

The second morning after a tour of LLL's ETV facilities, Assistant Deputy Director Wally Decker led an on-camera panel discussion covering technical and administrative aspects of the LLL TV system and the LLL/Sandia network. The seminar concluded with several hours' presentation and discussion of video tapes produced by Western Region Bell System installation.

Sandians making seminar presentations were Hank Willis (4230) and Marlin Pound and Jim Smith (both 8214). Jim also coordinated seminar arrangements.

## Take Note

Roy Tackett (8362), with a low net score of 65, won the first-place, overall trophy in the annual Seniors Golf Tournament, sponsored by the Sandia Employees Golf Club at Livermore's Las Positas course. Roy played in the first flight — for senior employees (over 50 years of age) — in which Leo Gutierrez (8100), Walt Dzugan (8212) and Ray Leri (8265) tied for second with low net scores of 69. In the second flight — for regular members — Dell Houser (8423) finished first with a low net of 67 and Gary Whitten (8183) came in second with a low net of 70. Bill Ormond (8261) won the "fewest putts" contest.

## Congratulations

Lavonne Lightsey (8430) and Stan Pickens (8161), married in South Lake Tahoe, Nev., July 24.

## Recreation Notes

### FUN & GAMES

**Softball** — Sandia Labs sponsored a men's fast pitch team in the Albuquerque Parks and Recreation softball program. The "Sonics" finished second in league play, and lost in the finals to also finish second in the post-season tournament. The "Sonics" posted a 19 win 5 loss record overall. Team members were: Bob Axline (2124), Bill Drozdick (9651), Roy Hanson (9515), Jim Jorgensen (2125), Jim Landavazo (9653), Dennis Mangan (1755), Tom Plummer (9742), Gary Reif (2522), Dave Renninger (9653), Larry Rollstin (1335), George Staller (5243), Art Trujillo (5741), Ralph Trujillo (5811), Ron Van Theemsche and Bob Varga (both 9652). The "Sonics" are managed by Dave Humphreys (9652).

\* \* \*

**Golf** — The Sandia Golf Association (Women) conducted three tournaments during July with the following winners recorded:

Los Alamos Tournament, July 10 — Pat Anderson (9422), low gross; Lillian Mancuso (3321), low gross runnerup; Reba Garrison (1320), low net; Alice Smith (3141), low net runnerup; Betty Chappell (retired), low putts.

Sunport Par 3 Tourney, July 17 — Betty Chappel, low gross; Pat Hefley (3141), low gross runnerup; Sybil Milligan (retired), low net; Mary Gonzales (2125), low net runnerup; Earlene Brinegar (4252), low putts.

Scotch Foursome, July 25 — Clara Gearhart (3141) and Ralph Campbell (3171), low gross; Reba Garrison and Ken Flynn (4335), low gross runnerup; Pat Hefley and Max Richter (3281), low net; Mary Gonzales (2125) and Martie Gonzales (5813), low net runnerup; Eleanor Kelley (4231) and Norm Scott (9551), low putts.

\* \* \*

**Running** — Pete Richards (5132) came in second (2 hrs., 44 min.) in the over-40 category in the recent Pike's Peak Marathon. Irv Hall (1237) finished tenth (3 hrs., 8 min.). The course starts at 6400 ft. and climbs to 14,600 ft. in 14.2 miles. Some 473 runners entered the event.

### Take Note

The public is invited to "Toastmistress Debut," an event to introduce the organization's program of public speaking training to prospective members, on Sunday Aug. 8. The tea will be held from 3 to 5 p.m. in the hospitality room of the Albuquerque Federal Savings and Loan Association, 4901 Central NE. For additional information call Ann McIntyre (1331), 4-4278.

\* \* \*

The Albuquerque National Arts and Crafts Benefit, sponsored by the Council for Exceptional Children, is this weekend, Aug. 6-8, at the Agricultural Exhibit Hall at the State Fairgrounds. The keynote exhibit features Indian artists from throughout the Southwest. Admission is \$1; no admission fee for children under 12. Show hours are 10 a.m. - 10 p.m. today and tomorrow, and 10-8 p.m. Sunday.

\* \* \*

The Albuquerque/Bernalillo County Bikeway Committee needs two biking enthusiasts to serve three-year terms. The Committee advises both the city and the county on all matters relating to bicycling. If you live in the city and wish to influence biking policies, call Sharla Vandevender at 4-6796. Familiarity with bicycling conditions in either the University area or the downtown-Old Town area would be helpful.



ELDON BOES (5719), one of the Sandia instructors for a special science class for selected Albuquerque high school students, discusses a solar water pump, one of the many unique projects prepared by students in the class. Students also built a transistor radio during the six-week course.

## Sandians Teach 'Enriched' Science Course for APS

A number of Sandians cooperatively taught an "enriched" Sandia/Albuquerque Public Schools Science Program for selected high school students this summer. Thirty-four students, between their sophomore and junior years, successfully completed the six-week course and earned one-half credit toward graduation. The class met two hours a day, five days a week, half of the students at Albuquerque High School and half at Highland High.

The program, now three years old, was developed by Bill Spencer, Director of Microelectronics 2500, who initiated a similar program in Newark, N.J., before coming to Sandia from Bell Labs.

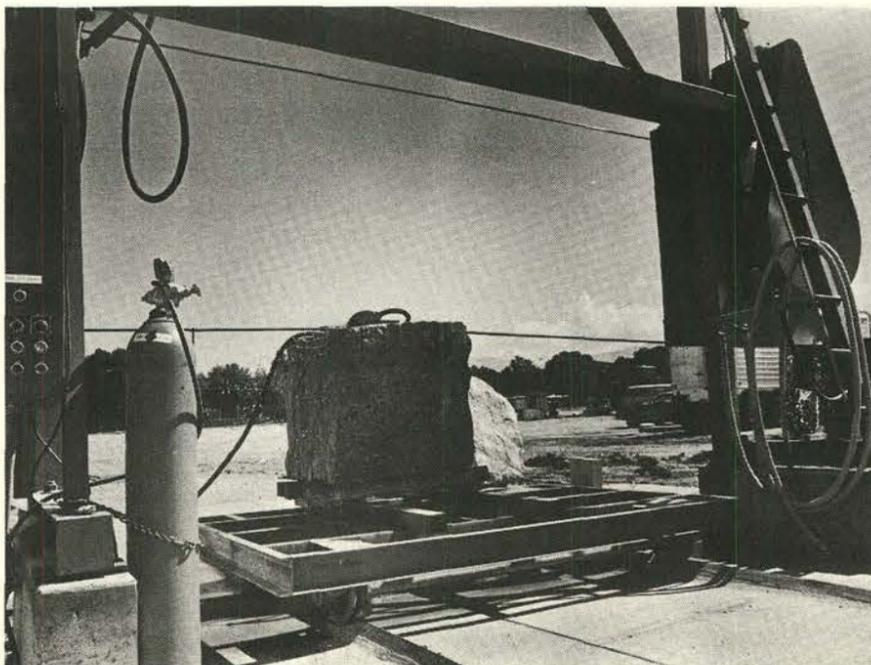
"The program is aimed at attracting into engineering and science careers young students with high potential," Bill says. "Students at this early point in their high school careers will have taken some basic mathematics and beginning science courses. But they'll also have two more years of high school remaining after the program.

Hopefully, it will stimulate them to take more science and mathematics courses. And we want to demonstrate to the students that engineers and scientists have varied and interesting careers related to real life problems."

As part of the course work, each student built a six-transistor radio and participated in the construction of a solar energy device. Other course work included physics, electronics, materials science, math and computing. In addition, the students toured their Sandia instructor's work areas.

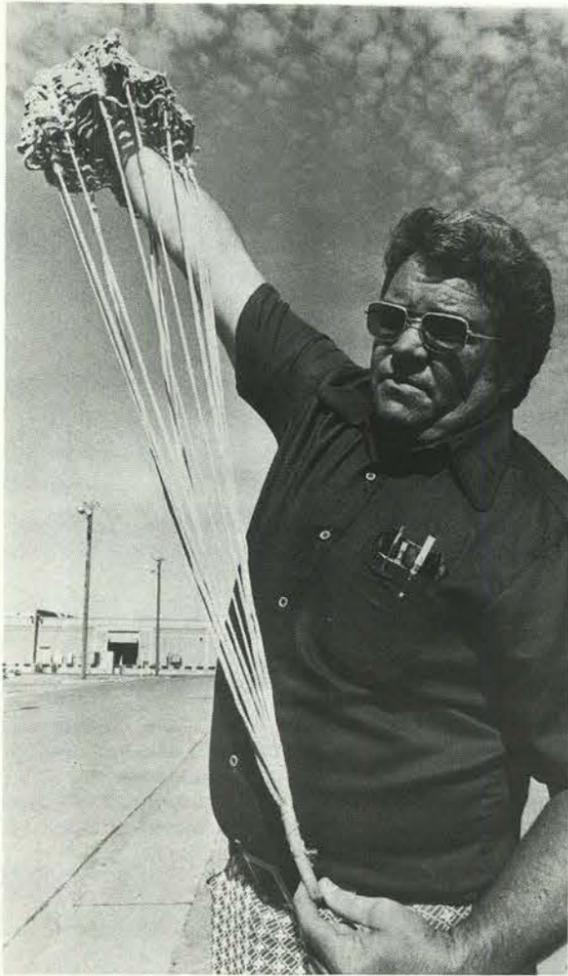
Sandia instructors included Fred Magee (2643), Bernie Kenna (5824), Jim Caruthers (5846), Ray Harrigan (5711), Jim Bushnell (9352), Gil Cano (5433), Keith Johnstone (5846), Gene Venturini (5132), Gary Shepherd (2634), Ron Trelue (2643), Margaret Mauser (2643), Larry Lane (2643) and Eldon Boes (5719).

Wayne Trump (4231) coordinated the program with APS instructors Marshall Floyd and Gladys Anderson.



IF YOU'RE EVER seized by an uncontrollable urge to hack a rock in two, you'll be happy to know that the Labs now has a genuine rock saw. Located just east of Bldg. 851, it cuts limestone and sandstone "like butter" (according to our source), but the rock of ages — in this case pink granite — takes longer. Saw was acquired to support drill bit technology activities of Drilling Research Division 5735. A plastic sleeve embedded with diamond dust around the cable provides the cutting edge.

## Ted Siegrist— Man of Many Hobbies



DENNIS CRONIN (1332) displays new 19-in. diameter Kevlar parachute designed for ballistic nosecone recovery.

*Continued from Page One*

### New Parachute Material Tested

a Mach 2.2 rocket sled in Area III last week. The Kevlar structural components performed well.

Dick Ericksen of Composite Materials Development Division 5844 is assisting the parachute lab in evaluations of Kevlar. At Livermore Labs, Arnold Rivenes, Marve Loll, and Ray Rychnovsky (all 8158) are working on applications of Kevlar in parachutes.

"All in all," says Dave McVey, supervisor of Parachute Systems Division 1332, "the future of Kevlar in recovery and retardation systems appears very bright indeed."

### Events Calendar

- Aug. 6-22 — Barn Dinner Theatre, "Sunshine Boys," 281-3338.
- Aug. 6 — Community Center Arts and Crafts Fair, Old Town Plaza, 3-8 p.m.
- Aug. 8 - Oct. 10 — Museum of Albuquerque, "Australian Aboriginal Art."
- Aug. 8 — Albuquerque Parks and Recreation Department, Ballet Folklorico de Albuquerque, Rio Grande Zoo, 3-4 p.m.
- Aug. 10, 17 — KNME-TV, American Indian Artists Series, 8:30 p.m.
- Aug. 10 — Albuquerque Road Runners, casual running meet, Montgomery Park, Bruner, 266-1354.
- Aug. 12-15, 19-22, 26-29 — Corrales Adobe Theatre, "Streetcar Named Desire," 898-3323.
- Aug. 13-14, 19-22, 27-28 — Civic Light Opera, "Promises, Promises," 344-2317.
- Aug. 14 — Maxwell Museum Association, day long outing to Abo, Quarai, Gran Quivira, 277-4404.
- Aug. 15 — Albuquerque Parks and Recreation Department, Mime Experiment, Tiguex Park, 3-4 p.m.



Early Carving

Ted Siegrist (3645) courted his wife Helen by presenting to her figures of Indians that he had carved out of fine grain maple wood. That was 33 years ago, and Ted is still carving wood, among other things. His hobbies have expanded to include furniture making, leather tooling, and photography — interests he shares with Helen.

Their home is filled with the products of their hobbies — carved frames for paintings and photographs, wall panels, beautiful carved furniture, decorative pieces, candlesticks, display cases and replicas of birds and bears.

The furniture includes a massive black walnut chest with carved drawer pulls, several chests and a corner desk out of oak, tables and display cases made from various hard woods and a pine sewing cabinet.

Miniature crosses with insets of stained glass and clear epoxy have become Ted's trademark. He has made more than 500 of them — some to sell and others for gifts to family and friends. Several larger crosses are used as decorative wall hangings. Ted spends as many as six hours making a single cross. The epoxy requires painstaking polishing.

When their daughter was small Ted made her a miniature restaurant rather than a doll house. The cafe features tiny counter stools that rotate, a miniature cash register with a drawer that works, a thimble-sized coffee pot, and all of the associated odds and ends of a working restaurant including the menu on the wall and a sign reading "no credit."

Ted's leather work ranges from tooling intricate designs on handbags, belts and hat bands to a personalized camera case. The extra lenses for his camera all have monogrammed custom-fitted cases.

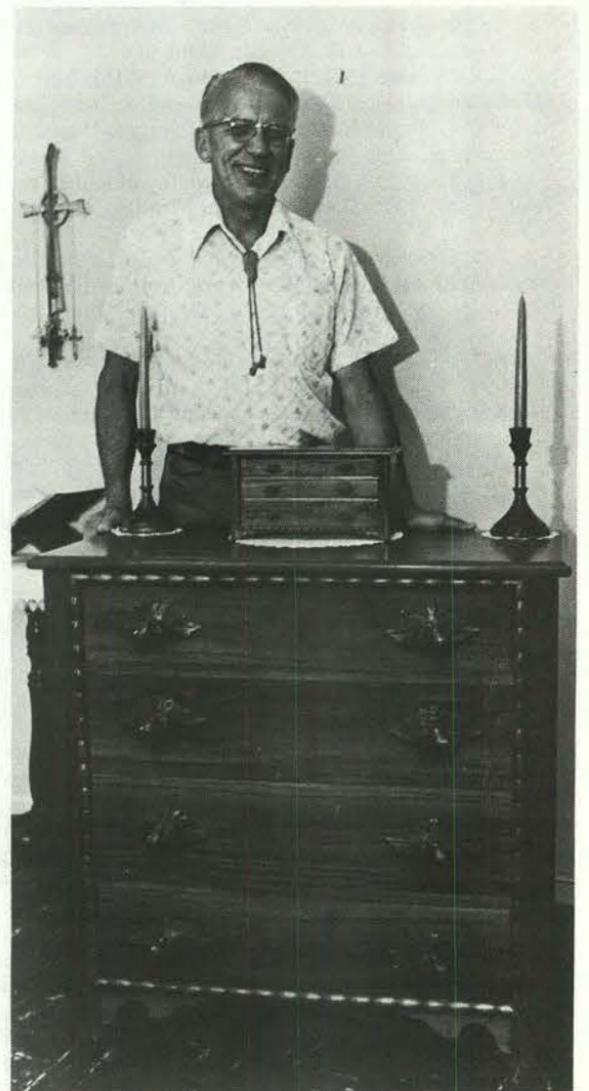
Close-up views of flowers is Ted's primary interest in photography although his file of more than 3000 slides contains many outstanding landscapes.

A machinist at Sandia, Ted also has a number of machines in his garage which he uses in his wood work. His woodcarving tools in his well-organized workshop gleam with a razor sharpness.

"It seems I don't have enough time to work on all my projects," Ted says, "but this will change in February when I retire. I'm really looking forward to it."



TED SIEGRIST (3645) displays some of his carved crosses with colorful stained glass and clear epoxy insets.



BLACK WALNUT CHEST features carved fruit-design drawer pulls and aromatic cedar lining. Ted started with two rough logs, cut them into planks and hand planed the first cut. Final sanding and hand rubbed finish took weeks of work. Miniature chest is a jewelry case made from the same wood and with the same design motif.

### Credit Union Reporter

Robert Cowdrey, former cashier of Citizens Bank and Western Bank, recently joined the Sandia Laboratory Federal Credit Union as Comptroller, a newly-created position.

Otis Cox (3223), long time volunteer worker for the Credit Union, has resigned from the board of directors. He has served as supervisory committee chairman, vice president of the board, and a member of the operations and education committees. Otis will be entering UNM in the fall to prepare for the CPA examination.

Marv Daniel (4312) is the new vice president of the board. Appointed to fill the vacancy on the board is Ralph Hampy (2151) who will serve until the next annual meeting of Credit Union members.

### ENERGY SAVINGS

COMPARED WITH USAGE IN BASE PERIOD - JULY 1972 THRU JUNE 1973  
CURRENT REPORTING PERIOD ENDING JUN '76

ELECTRICITY	BASE PERIOD 92276 MWH 1976 77111 MWH	16.4 % SAVED
STEAM PLANT FUEL EQUIV. OIL	BASE PERIOD 224583 BBLS 1976 196496 BBLS	12.5 % SAVED
VEHICLE MILES	BASE PERIOD 2468 MI. 1976 2109 MI.	14.5 % SAVED

## Speakers

M.A. Duguay (5214), "Soft X Ray Lasers," Quebec Summer Workshop on Synchrotron Radiation Facilities, June 14-18, Quebec, Canada.

G.C. Tisone (5212), A.K. Hays (5215), and J.M. Hoffman (5212), "10<sup>9</sup> Watt KrF and ArF Molecular Lasers," Ninth International Quantum Electronics Conference, June 14-18, Amsterdam.

L.F. Shampine (5122), "The Quality of Runge-Kutta Formulas," 1976 SIAM National Meeting, June 16-18, Chicago.

P.M. Richards (5132), invited paper, "Studies of Impure Linear Chain Heisenberg Antiferromagnets," ACS Rocky Mountain 1976 Meeting, June 17-19, Laramie, Wyo.

R.P. Clark (2523), "Phase Diagram for the Ternary System LiCl-CaCl<sub>2</sub>-CaCrO<sub>4</sub>," the Sixth North American Thermal Analysis Society Conference, June 20-23, Princeton, NJ.

D.A. Reynolds (1255), "Fault Detection Capabilities of Alternating Logic," 1976 International Symposium of Fault Tolerant Computing, June 21-23, Pittsburgh, Pa.

R.A. Kiehl and E.P. EerNisse (both 5133), "Frequency Control of Trapatt Oscillations by Optically Generated Carriers," 34th Annual Device Research Conference, June 21-23, Salt Lake City.

A.R. Baldwin (2522), "A Sixty Minute Thermal Battery;" S.C. Levy (2523), "Electrical and Environmental Testing of Lithium V<sub>2</sub>O<sub>5</sub> Cells: I. Storage and Discharge Rate Studies;" S.C. Levy, "Electrical and Environmental Testing of Lithium V<sub>2</sub>O<sub>5</sub> Cells: II. Temperature and Shock Studies;" S.C. Levy, "Temperature and Shock Testing of Lithium-Organic Electrolyte Cells;" S.C. Levy, "Storage and Discharge Tests of Lithium-Organic Electrolyte Cells;" 27th Power Sources Symposium, June 21-24, Atlantic City, NJ.

A.B. Stephenson (9473) "Tornado-Generated Missiles-Full Scale Testing," A Symposium on Tornadoes, Assessment of Knowledge and Implications for Man, June 22-24, Texas Tech Univ., Lubbock.

G.A. Fowler (1000), R.C. Maydew (1330) and W.R. Barton (1331), "Sandia Laboratories Rocket Program - A Review;" W.R. Barton and W.A. Millard (both 1335), "The Effects of Spin on the Malemute Rocket Motor Obtained in Ground and Flight Tests," AIAA 4th Sounding Rocket Meeting, June 23-25, Boston, Mass.

D.L. Mangan and J.D. Williams (both 1755), "Research Reactor Safeguards Study;" Williams and Mangan, "Radiation Effects on Electronic Devices Used Near Nuclear Reactors;" J.M. deMontmollin (1750-A) and R.B. Walton (LASL), "Comprehensive Safeguards Systems for Nuclear Facilities;" L.W. Chapman (5741), "Fixed-Site Safeguards System Effectiveness Modeling;" R.B. Worrell and D.J. Gould (both 1754), "A Data Base for Physical Security Barriers;" D.D. Boozer (1754), "Fixed-Site Safeguard System Effectiveness Modeling;" H.A. Bennett (5741), "Economic Analysis of Escorts and Response Forces in Transportation Security;" J.M. deMontmollin (1705A), "Facility Safeguards Based on Closed-Loop Control;" W.C. Fienning (1751) and F.M. Raymond (9423), "Authentication of Data Link Transmissions Topic: Data Transmission;" B.L. Hulme (5122), "Graph Theoretic Models for Nuclear Safeguards Studies;" G.B. Varnado (5412) and H.A. Bennett (5741), "Safeguards System Effectiveness Evaluation for Nuclear Facilities;" G.B. Varnado (5412), H.A. Bennett (5741), S.L. Daniel (5411), D.D. Boozer (1754), D. Engi (5741), L.D. Chapman (5741), and B.L. Hulme (5122), "Safeguards System Effectiveness Modeling," Annual Meeting of the Institute of Nuclear Materials Management, June 23-25, Seattle, Wash.

G.F. Derbenwick (2141) and B.L. Gregory (2140), "Processing Effects on MOS Device Hardness," Electronic Materials Committee (AIME) Meeting, June 23-25, Salt Lake City.

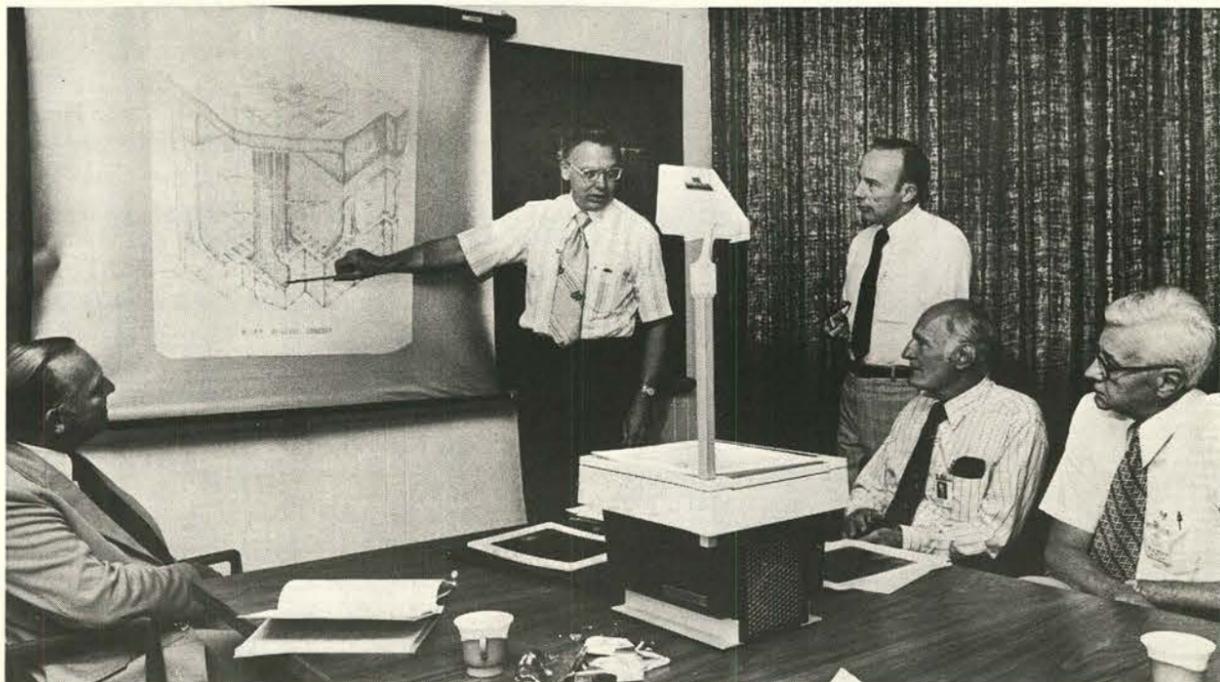
J.R. Asay (5167), "High Pressure Measurements with Interferometry," Internal Seminar at Los Alamos Scientific Laboratory, June 25.

G.R. Case (2142), "Analysis of Actual Fault Mechanisms in CMOS Logic Gates;" B.W. Lindsay and B.T. Preas (both 2142), "Design Rule Checking and Analysis of IC Mask Designs;" Preas and Lindsay, "Automatic Circuit Analysis Based on Mask Information," 13th Design Automation Conference, ACM, June 27-29, Palo Alto, Calif.

D.E. Grady (5163), "Recent Advances in Shock Wave Studies on Rocks and Minerals," and "Processes Occurring in Shock Wave Compression of Rocks and Minerals," U.S.-Japan Seminar on High Pressure Research Applications in Geophysics, July 6-9, University of Hawaii, Honolulu.

R.L. Ward (5441), "Heat Inactivation of Poliovirus in Wastewater Sludge: The Effect of Circudal Agent Produced During Anaerobic Digestion," Symposium on Virus Aspects of Applying Municipal Wastes to Land, Univ. of Florida, June 28-29, Gainesville.

J.R. Freeman (5241), "Hydrodynamic Instabilities in Electron Beam Fusion Targets," Gordon Research Conference, June 28 - July 2, Santa Barbara, Calif.



**BILL SNYDER**, Director of Nuclear Fuel Cycle Programs 5400, discusses plans for a proposed nuclear waste disposal pilot plant in an underground salt formation near Carlsbad during program briefings at Sandia recently. Attending were Gen. J.K. Bratton (standing), Director of Military Application for ERDA; President Morgan Sparks; and Gen. Dodd Starbird (right), ERDA Assistant Administrator for National Security. At extreme left is Herman Roser, Manager, ERDA/ALO. Also attending was M.I. Yarymovych, ERDA Assistant Administrator for Field Operations. Other presentations were made by members of Sandia's Small Staff.



**FRANK KLEINHENZ**, Chief Administrative Officer for the City, headed a group of officials visiting Sandia's Technical Library last week. He discusses information retrieval and reference systems with Danny Seager (3144) and Calla Ann Pepmuller (3140).

C.B. Norris (5112), C.E. Barnes (5133), and D. Zanio (Hughes Research Lab), "Cathodoluminescence Studies of the 1.4 Ev Bands in CdTe," 2nd International Symposium on Cadmium Telluride: Physical Properties and Applications, presented by Zanio, June 29 - July 2, Strasbourg, France.

C.W. Gwyn (2142), "An Integrated Set of Computer Aids for Custom IC Design," IEEE Circuits and Systems Chapter Seminar, July 1, Palo Alto, Calif.

H.J. Rack (5832), "Notch Constraint Effects on the Dynamic Fracture Toughness of an Unaged Beta Titanium Alloy," International Conference on Dynamic Fracture Toughness, July 5-7, Cambridge, England.

J.F. Gonzales (3644), "Rebuilding Machine Tools;" K.E. Sutton (3410), "Control of Noncapital Equipment;" L. Faw (3646), "Sandia Laboratories Automated Equipment Management System," ERDA-Wide Property and Supply Management Conference, July 7, Tulsa, Okla.

C.E. Land (5133), "PLZT Material Properties of Importance to Information Storage and Display Applications," ARPA Materials Research Council Summer Conference, July 7-8, La Jolla, Calif.

J.L. Mitchiner (5742), "Experience with Parameter Identification for Socioeconomic Models," MEXICON '76, presented by J. Brewer, UC-Davis, July 7-10, Mexico City.

P.J. Slater (5121), "Selecting Central Locations in a Graph," NSF-CBMS Regional Research Conference, June 28 - July 2, Minneapolis, Minn.

R.L. Schwoebel (5820), "An Inorganic Ion Exchange Process for Partitioning High Level Commercial Waste," Proceedings of USNRC Technical Workshop on Waste Partitioning, June 8-10, Seattle, Wash.

K.T. Gillen (5813) and E.A. Salazar (5811), "Accelerated Aging: A Proposed General Approach for Evaluating Synergism Under Combined Stress Environments," IEEE 381 (Working Group for the

qualification of modules for the nuclear power industry), June 21, Albuquerque.

J.S. Pearlman (5214), "Evaluation of Polarization Dependent Thermal Conductivity;" and "Evidence for Polarization Dependent Thermal Conductivity," June 7-10, LLL.

D.E. Bennett (5412), "Gun Control - Scapegoat for Crime Control," Downtown Kiwanis Club, May 19; and Rio Grande Kiwanis Club, June 21.

G.W. Hughes (1243), "Astronomy," Mile-High Optimist Club, June 10, Albuquerque.

J.F. Banas (5742), "Wind Energy Research," Society of American Military Engineers, June 17, Albuquerque.

G.C. McDonald (9623), "Backpacking Made Easy for Sedentary Citizens," Mile-High Optimist Club, June 17.

A.D. Swain (1222), "Motivation of the Volunteer Worker," Rio Grande Lions Club, June 18, Albuquerque.

G.H. Miller (5216), "Science History - Fact and Fancy," Lost Altos Civitan Club, June 24, Albuquerque.

W.N. Sullivan (1284), "Wind Energy Research," Caravan Shrine Club, June 28, Albuquerque.

J.R. Freeman (5241), "Electron and Ion Beam Fusion," invited lecture, IEEE Mini-Course on Fusion, May 26-28, Austin, Texas.

## Death

Elizabeth White of Payroll Section 3252-3 died July 30 after a long illness. She was 56.

She had worked at Sandia since January 1955.

Survivors include her husband, a daughter and two grandchildren.



# New Displays at Coronado Monument



Four hundred and thirty six years ago, Coronado's expedition reached the vicinity of present-day Albuquerque, made contact with the natives of the dozen Tiwa-speaking pueblos in this area, and settled in with the people of Kuauua for the winter of 1540-41. The ruins of Kuauua now comprise the Coronado State Monument. Located on a high bluff about three miles west of Bernalillo, Kuauua is a dramatic site that offers a spectacular view of the Rio Grande, the valley and the Sandia Mountains.

Most people who live in Albuquerque have visited the ruins. There are a couple of reasons which make another visit at this time worthwhile.

First, the small museum at the site has been spruced up and contains a number of new exhibits, including the original murals from the "painted kiva," first excavated by the Museum of New Mexico in 1934. Important because they are the most complete of any paintings found in pueblo ruins, the original murals were removed to ensure their preservation and for further study. They provide graphic insight into early pueblo religion.

The kiva from which the murals were removed was reconstructed, then the paintings were faithfully copied and repainted in place. Through the years, students of Indian culture have visited the restored kiva.

The ruins of Kuauua are impressive. The pueblo contains more than 1200 ground-floor rooms, several kivas and two plazas. The Museum of New Mexico, which administers the State Monument, has provided excellent markers at various locations in the ruins. Many of these markers (written in English and Spanish) contain quotes from the scribes in Coronado's expedition.

"Tiguex is a province of twelve pueblos, on the banks of a large and mighty river. Some of the pueblos are on one bank, some on the other. It is a spacious valley two leagues wide. To the east there is a snow-covered sierra, very high and rough."

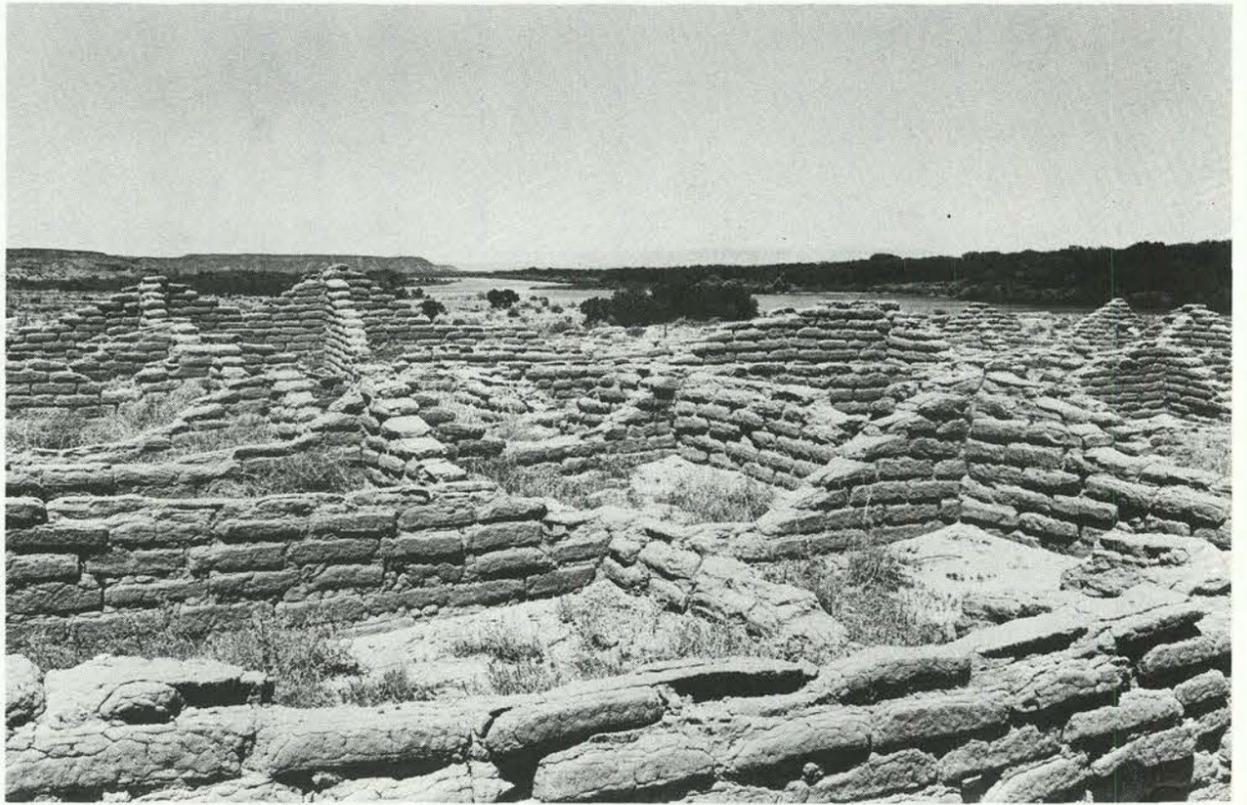
—Pedro de Castaneda, 1540

The plaque summarizes the remainder of Castaneda's journal.

"The Spanish Conquistadors occupied one of the pueblos in the Tiguex Province during the winters of 1540-41 and 1541-42. This pueblo, Kuauua, is believed to be the northernmost village of the Tiguex Province, and it was undoubtedly visited by the Spanish.

"At first the Tigua people welcomed the visitors and submitted to their demands for food, shelter and clothing. However, demands of the army became unbearable. The Tiguas staged a desperate revolt against the Spanish invaders in the winter of 1540-41. The results were disastrous for the pueblo people. Two villages were destroyed and many of the people killed."

There's another reason for visiting Coronado Monument. It is the sense of the place, of its being a crossroads in history. Here in the Rio Grande Valley with the looming Sandia Mountains, European culture met the North American Pueblo Indian, and the country was forever changed. Ponder the



RUINS of the 1200-room Kauau pueblo, where members of Coronado's expedition spent the winter of 1540-41, are now part of the Coronado State Monument located about three miles west of Bernalillo. Pueblo was inhabited from about 1300 to 1600.



FROM ENTRY of museum at Coronado State Monument can be seen the river and the Sandia Mountains. Camping facilities are available in the State Park adjacent to the Monument.

fate of Coronado, who sought riches, but found only imprisonment upon his return to Mexico. And the fate of the 12 pueblos of Tiguex. Only two remain — Sandia Pueblo and Isleta Pueblo.

Still, the valley, the river and the mountains are unchanged. It is peaceful here.

**FREE**  
**A Two-Minute Enginalysis**  
Coronado Center  
August 7 10-6  
●Improve gas mileage  
●Save money

# MILEPOSTS

## LAB NEWS

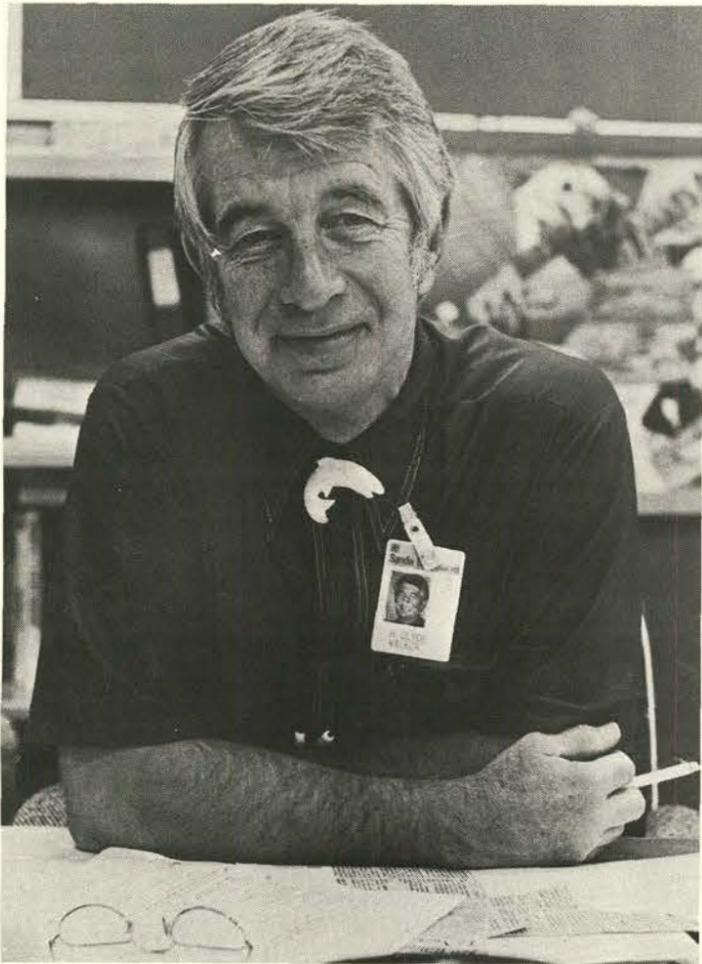
August 1976



Ken Swanson - 9633 15



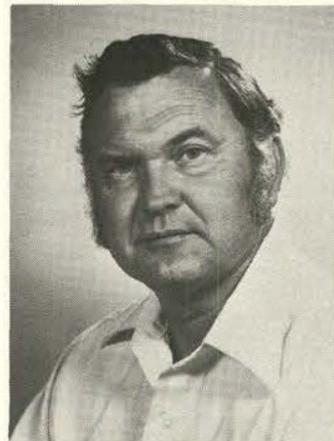
Earl Morris - 4336 20



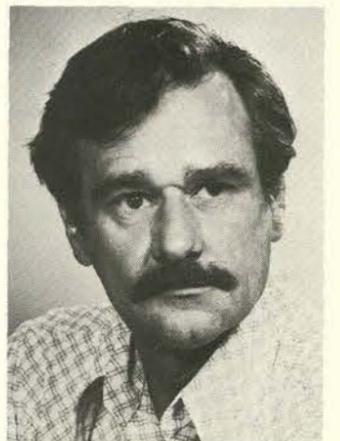
Clyde Walker - 1140 25



Ruben Urenda - 2326 15



Clarence Robertson - 9412 15



Donald Fogel - 1123 15



J.T. Foley, Jr. - 1345 20



Bill Martin - 9550 25



Andy Breckenridge - 3732 15



George Perkins - 2353 15



Jack Leroy - 1713 20



Don Burns - 2321 20



Bernie Vallejos - 3171 15



Walt Rosenberg - 9630 30



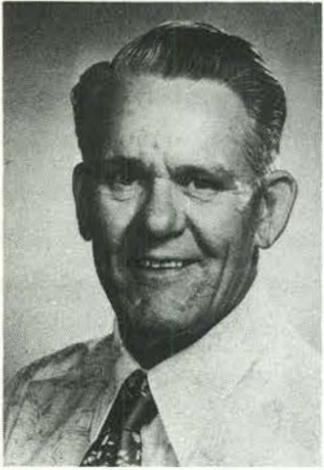
Dick Martin - 1715 25



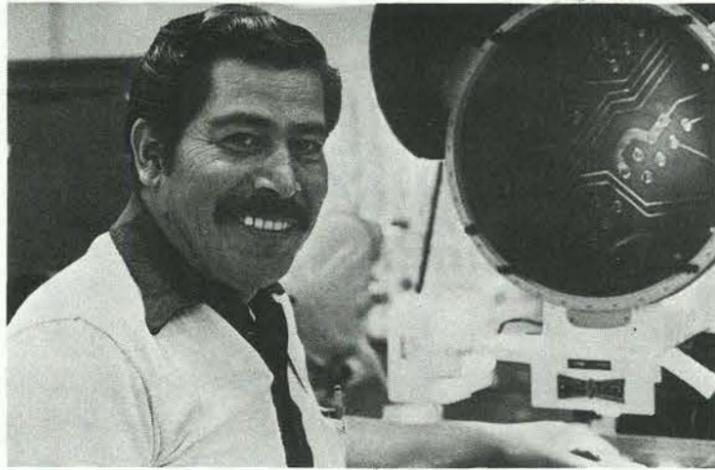
Theodore Pfeffer - 1135 25



George Kolesar - 9622 15



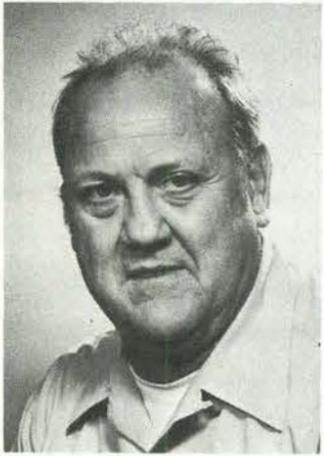
Don Coleman - 3313 25



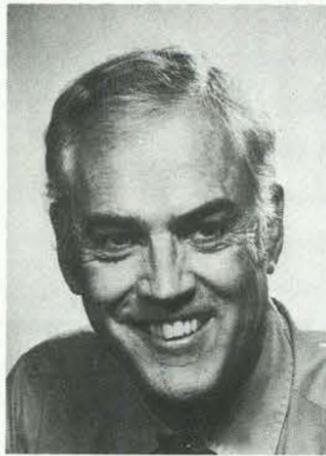
Richard Chavez - 3623 20



Bill Sherman - 9524 25



George Reis - 1331 25



Tom Strome - 1211 25



Jack Williams - 1714 25



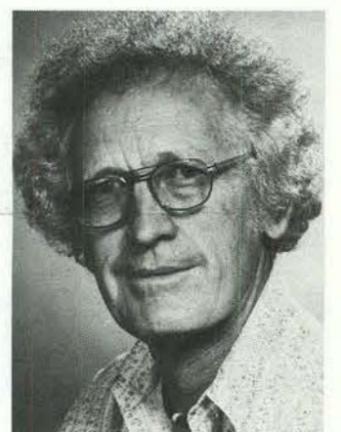
Joe Mickey - 3155 20



Elden Van Vickle - 9711 25



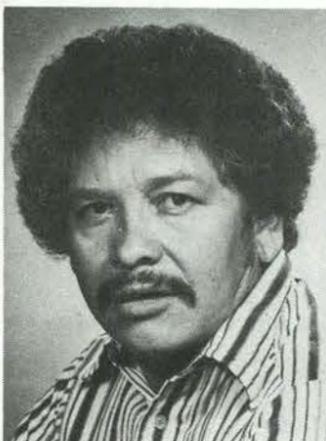
Ellen Wood - 9753 25



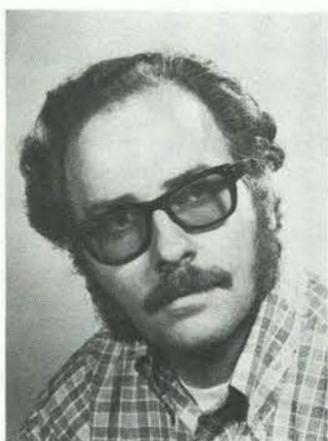
Joe Sanchez - 3727 20



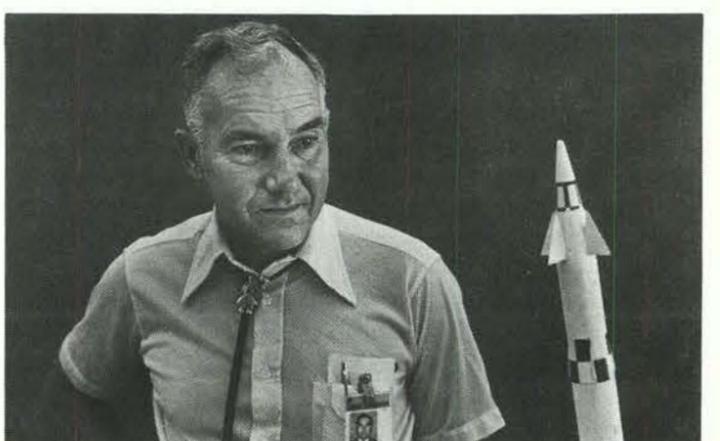
Bill Purchase - 3735 20



Amos Alire - 9712 20



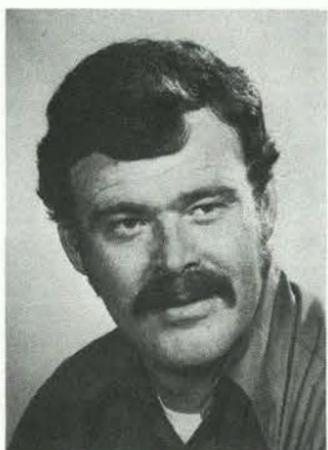
Fred Reinhardt - 2523 10



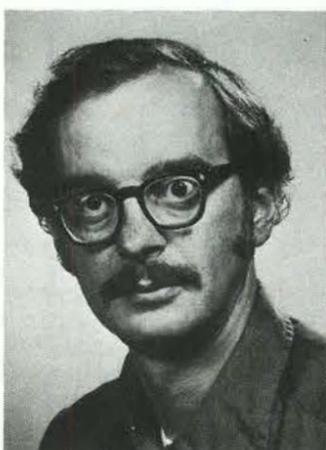
John McKiernan - 1222 25



Lois Wade - 211 15



Don Keener - 9652 10



John Weinlein - 2326 15

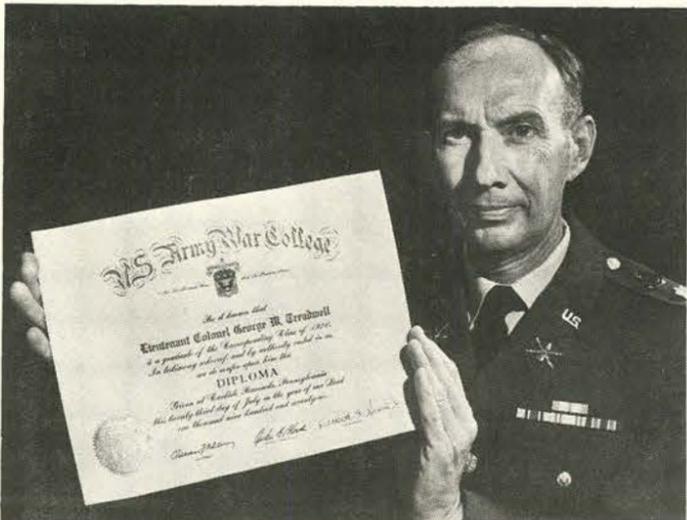


Larry McConahy - 1735 10

# sandia PEOPLE Report



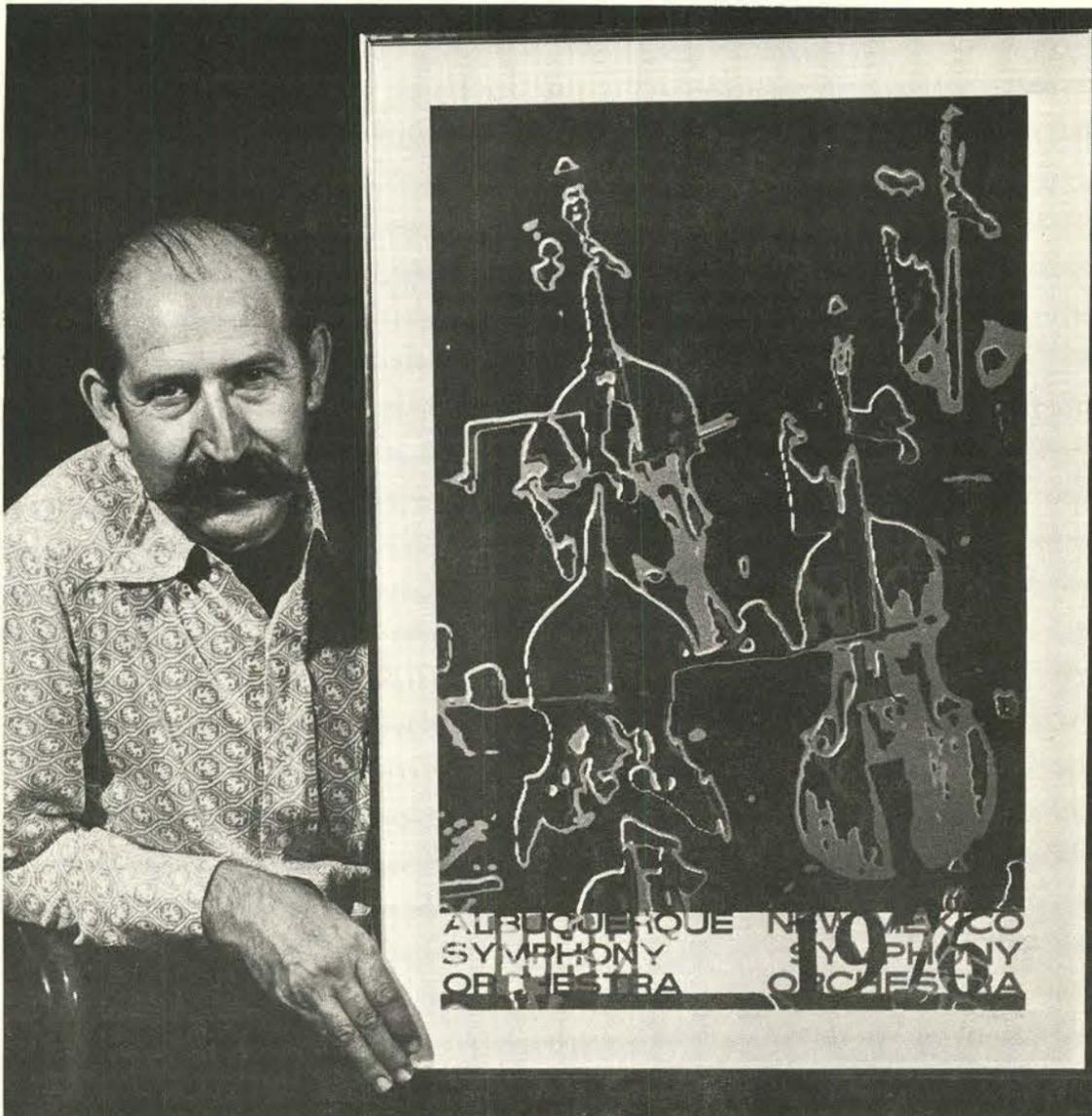
**KEN SWANSON (9633)**, newly-elected president of the Albuquerque Rose Society, discusses operation of the Prospect Park Rose Garden (near Wyoming and Menaul) with Louise Major (retired), treasurer. The 150-member Society maintains more than 1100 rose bushes with name tags in the Park for enjoyment and education. If you plan roses for your yard, this is a good place to decide which kind you'd like. The group also sponsors the State Fair rose exhibit and contest and a spring contest event. For membership information, call Ken, 4-7332.



**GEORGE TREADWELL (5712)** displays diploma earned after two years of correspondence courses (plus two-week stints of active duty) from the U.S. Army War College. George is a Lt. Col. serving as Operations and Training Officer for the Adjutant General of the New Mexico National Guard. He has been a member of the Guard for 28 years. The War College, conducted at graduate school level, is the Army's highest educational institution.

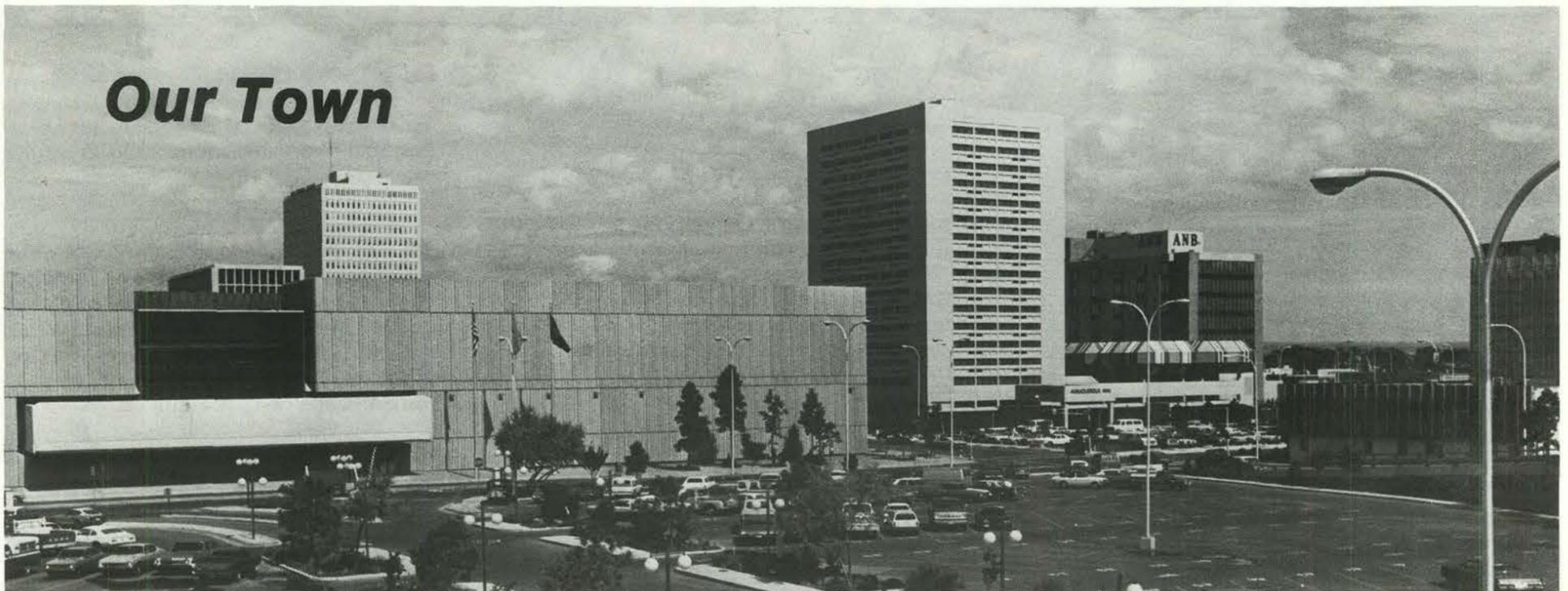


**SANDIA LABS EMPLOYEES** were congratulated recently by the Treasurer of the United States, Mrs. Francine Neff, for their continued support of the Savings Bond program. Sandians are saving over \$100,000 each month through the Payroll Savings Plan for bond purchases. About 80% of the Labs employees participate, Livermore employees leading with 91% participation. Mrs. Neff, left, paid an official visit to Sandia with New Mexico Savings Bonds Director, Mrs. Evelyn Oberg. They are shown with Mr. Sparks, reviewing participation reports. "Sandia is setting an example I like to talk about," Mrs. Neff said. "I'm proud to cite the record of business and industry in my home state."



**JOE LAVAL (3163)** shows a lithograph (one of 100) executed as a fund raising project for the New Mexico Symphony. In brilliant colors, the lithograph started as photographic images reduced to abstract design. Numbered prints (\$100 each) are on sale at Brandywine Galleries, Western Gallery of Fine Art and the Mercado, Sheraton Old Town Inn. Lithographs were printed at Tamarind Institute.

# Our Town



ALBUQUERQUE CONVENTION CENTER at 401 Second Street NW is the heart of the city's convention business as well as a center for cultural events — concerts, arts and crafts exhibits, antique shows, auto displays, flower garden shows and even horse auctions. Current estimates are that some 650 conventions will be held in Albuquerque this year, attended by 150,000 delegates, bringing some \$20

million in business to the city. In 1975, conventions numbered 582 attended by 131,500 delegates. Business was estimated at \$15 million. The Convention Center opened in October 1972 after an expenditure of \$9.2 million for construction and furnishings. For help in planning conventions, contact Dan Poole, Albuquerque Chamber of Commerce, 842-0220.

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1. Limit 20 words.
2. One ad per issue per category.
3. Must be submitted in writing.
4. Use home telephone numbers.
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

- COUCH and matching chair, Stratford, slip covered; 40" aluminum awning, best offer. Callender, 266-3047, after 5.
- ROLLAWAY BED, single, mattress, \$35; portable Webster heavy duty typewriter, case. Pitti, 256-1629.
- AQUARIUM, 20 gal., stand, hood, light, other accessories, \$40. Martinez, 294-2846.
- DAY CARE for pre-school child in the Morris and Candelaria area, fenced yard, lunch served. Hale, 298-1545.
- CANOPY BED, white French provincial, double, canopy frame, box springs, mattress, \$30; Mercury auto air conditioner, hardware. Oravec, 281-3667.
- TRAVELTRAILER, Holiday Rambler, 24', stereo, carpeting, sleeps 4, new tires, self contained, 8010 Aspen NE, \$3200. Peirce, 299-1946, 881-7588.
- GE WASHER/DRYER parts, both items, \$20. Russell, 294-1035, after 5:30.
- WIDE OVAL 50 tires, 4 ea., E-70, 14", on Appliance deep-dish mag wheels, fits moderate GM vehicle, \$200. Babich, 293-8737.
- FISHING FLIES, custom tied, 3/\$1. Swanson, 299-7833.
- CB ANTENNAS, 2 ea., 8', spring mounts, lead wire. Vonderheide, 843-6148.
- TAPE DECKS, Roberts 1740X cross-fields stereo, single motor, 3 spd., \$150; Ampex FR-100A 7-track, 6 spd., 1/2" tape, \$300. Kobs, 298-9133.
- TROLLING MOTOR, Phanton Husky electric, 6 or 12 volt, 3 spd., \$70. Sheaffer, 255-9473.
- '61 REFRIGERATOR, Coldspot, 12 cu. ft., with out meat tray, \$35. Stearns, 281-3872.

SOFA, Med. style, solid oak frame, reversible cushions, stratolounger, dark green vinyl. Lawrence, 266-7226.

KING-SIZE BED, Ethan Allan, headboard, swing-away frame, box springs, extra firm mattresses. Platt, 281-5318, Tijeras.

THREE CUSHION SOFA, avocado, yellow, tan stripe, new price \$1000, sell for \$500. Donaldson, 255-4024, weekdays.

WHEELS AND TIRES, 16", 5 hole, Ford truck; used 6.50X16 Goodyear tube type, 5 ea., all for \$40. Gallagher, 881-3965.

17 FOOT TRAILER, DeVille, new tires, new Monomatic toilet, butane refrigerator, sleeps 7, \$875. Houghton, 299-6230.

PIANO, Story and Clark console, early American style, \$1250. Parks, 293-9598.

CAMPER, 10 1/2' Teardrop cabover, Jiffy lift loader, sleeps 6. Biesterveld, 256-7983.

BASSET PUPPIES, AKC registered, ready Aug. 10, \$100. Morris, 881-1320.

CEILING FIXTURE, 5 light, Spanish or Mediterranean style, 17 1/2" high, \$25. Keeling, 296-9729.

METAL DETECTOR, Heathkit Model GD-348 deluxe, earphones, carrying case, extra battery, manual, \$150. Mead, 299-2396.

RECIRCULATING TOILET, Monomatic, for RV; RCBS reloading dies, 30 cal. M-1 carbine. Conrad, 299-5316.

BEAN BAG CHAIRS, foam rubber filled, one 3 1/2 ft. round by 3 ft. high, one 5 1/2 ft. by 3 ft. high. Paul, 299-6387.

PORTABLE TYPEWRITER, Underwood, case, \$20; \$285 lounge chair, \$85; four Samsonite cardtable chairs, \$15. Smitha, 293-1177.

SOFA, crushed velvet, avocado, 90" long, \$85. Denman, 296-6851.

CAMPER SHELL for Datsun pickup with 6 ft. bed, \$200. Chavez, 831-5220.

CONSOLE PIANO, Behning, mahogany bench, \$500. McIlroy, 299-4977, 296-7275.

NORWEGIAN ELKHOUND puppy, has shots. Brannen,

255-5816.

PASTURE for livestock, Aug. and Sept., North Valley, \$20/mo./head. Harley, 898-0594.

6 YEL ANTIQUE RUG, 5'x8', white background, history of previous owners and appraisal, make offer. Varan, 265-1396.

CASEMENT WINDOWS, 6-lite steel, 36" X 38", glass, screens, 2 for \$25; 30" X 6'8" hollow core door, hardware, \$5. Pennington, 256-9506.

BUCKET SEATS, 2 ea., recently re-upholstered, make offer. Cook, 294-2348.

EARLY AMERICAN HUTCH, 50" wide. Jeffers, 299-7020.

LARGE DINING ROOM suite, buffet, china cabinet, table. Rose, 298-4849.

LAWN MOWER, self-propelled, Craftsman, reel type, catcher, 18", \$40. Chandler, 256-9098.

HORSE TRAINING, riding lesson, boarding, instruction in western or English pleasure, equitation, dressage and jumping. Kirby, 898-7846, 299-2942, evenings.

### TRANSPORTATION

'72 FIAT 124, 4 dr. sedan, AT, \$1400 or best offer. Ault, 281-3280.

BICYCLE, Schwinn Varsity, 10 spd., brown, \$75. Tucker, 881-0247 after 5:30.

'60 FORD Starliner, \$89. Thatcher, 294-2731.

'69 VW, AT, radio, tape deck. Carr, 296-6882.

'73 DODGE Dart Swinger, PS, PB, air, 318 cid, AT, radial tires, below book. Marquez, 344-4771, after 5.

'72 DODGE COLT, new tires, \$1075 or best offer. Horton, 292-0440.

BICYCLE, Sears 3 spd., woman's, \$15. Baxter, 344-7601.

'73 YAMAHA DT-250 Enduro, street or dirt, less than 3000 miles, \$575 or best offer. Chapman, 292-2800.

'64 FORD Pinto, R&H, tape deck, \$1900. Vigil, 298-6188 after 5:30.

'74 BUICK LeSabre sedan, AM/FM/tape, cruise control, electronic ignition, AC, new tires, \$300 under book, will accept older trade-in. Miller, 255-1324.

18' BOAT, Chrysler Runabout, deep V, 120 hp Volvo I/O, tandem tilt trailer, travel cover, \$3000. Cleveland, 299-7420.

JUNK '63 Buick Special for trade. Wentz, 881-7125.

'75 HONDA 550 four Windjammer fairing, Bates trunk, crash bars, \$1600. Armijo, 268-7645.

'67 PEUGEOT model 404, 4 door sedan, \$600. Hansen, 898-3173.

'68 VOLKSWAGEN Bug, \$900; '65 Scout, 800 series 4X4 pickup, \$1200. MacDougall, 299-8496.

15' BOAT, Herter's fiberglass runabout, 35 hp Johnson motor, trailer, '69 model, \$750. Bohannon, 344-9235.

'70 DATSUN pickup, camper shell, 39,000 miles, 1600 engine. Carman, 296-0968, after 5:30.

'72 CHEVY Nova, AT, PS, AC, 2-door, 41,000 miles, \$1800. Conrad, 266-5063.

'70 CHEVY Kingswood station wagon, AC, PS, power gate, luggage rack, radial tires. Montoya, 883-9115.

'73 OLDS 98 Regency, 34,000 miles, cruise control, power options, AM/FM, etc. Thomas, 268-2565.

'72 PONTIAC Safari station wagon, three seats, AC, Michelin radials, new battery, radio, roof rack, below book. Atkins, 298-5762.

'64 DODGE Polara, see Friday or Saturday, make offer, 600 Bryn Mawr Dr. N.E. Norwood, 262-0073.

'72 CHEVY van, 6 cyl., standard shift, \$2450; '60 VW, '63 engine, sun roof, \$450. Puccini, 294-1704.

'71 VEGA Hatchback, dark green, white top, 4 spd. transmission, new tires and battery, \$925. Weber, 299-1389.

### REAL ESTATE

3 BDR., fireplace, recently remodeled, built-in S.C. oven, dishwasher, range, disposal, carpet throughout, energy efficient, near shopping, base, \$33,500. Allred, 294-1393.

MOUNTAIN CABIN on one acre, 930 sq. ft., stone front porch, 10 miles south of Tijeras. Sutherland, 266-1734.

MOUNTAIN CABIN at Platoro, Colorado, 2-story, 2-bdr., modern, furnished, fenced, 5 lots. Shively, Box 310,

Bernalillo, NM 87004, 867-5439.

IRRIGATED FARM LAND or homesites south of Belen, paved road. Juskiwicz, 877-8705, after 6.

HOUSE, den, 14' high slanted roof, sky lights, including attached one bdr. apt., \$39,500 or rent. Varan, 265-1396.

### FOR RENT

HOUSE, brick floors, beamed ceiling, 2 fireplaces, SW landscaping, 3 bdr., storage room, 2 baths, NE Heights, \$375/mo., \$200 deposit. McCampbell, 292-2762.

ONE BEDROOM APARTMENT, furnished, utilities paid, near Sandia, enclosed patio, cathedral ceilings, 541 Espanola S.E., \$200/mo. Aragon, 242-1651.

VACATION CONDOMINIUM at Purgatory, 2 bedrooms, furnished, sleeps 8, off-season rates. Carson, 898-8847.

### WANTED

BACK PACKING EQUIPMENT, pack, frame, stove, bag, etc. Boes, 292-1690.

HOME OR APARTMENT to rent, 2 or 3 bdr., for 1-2 months beginning Aug. 25. Kahe, 298-1717.

INDOOR CLIMBER and slide by Creative Playthings for pre-school child. Pickard, 298-8851.

IDENTITY of person holding number 79 in MK 28 group shot July 2. No name on returned card. Lab News, 4-7841.

10 OR 3 SPEED bike in good condition. Luetete, 299-9273.

### WORK WANTED

BABY SITTING, experienced teenager available anytime until school, then evenings and Saturdays, 75¢/hour. Lori, 299-4677

### LOST AND FOUND

LOST - Blue mechanical pencil. LOST AND FOUND, Bldg. 832, 4-1675.

FOUND - Assorted tools; R sunglasses in brown case (Schaumberg Optical-LASL); gold filigree hoop earring for pierced ears; small brass desk-type key (Curtis, Ind.); small brass key (8C). LOST AND FOUND, Bldg. 832, 4-1675.

FRIDAY	SATURDAY
6—HAPPY HOUR SEAFOOD BUFFET Adults \$3.25 Under 12 1.92 JIMMY CARTER SHOW from Nashville 8:30 - 12:30	7—VARIETY NIGHT Bob & Larry, Magicians SUMMER MAGIC Food @ 6 Show @7 Free to Members
13—HAPPY HOUR POT ROAST BUFFET Adults \$3.25 Under 12 1.92 NIGHTLIFERS Denny in Lounge	14—SOUL SESSION 9-1 110 IN THE SHADE Members Free Guests \$1

MY — inside informant (he never goes outdoors; "the great thing," he says, "about the Great Outdoors is that that's where it is.") tells me that now is the time to get your sarongs, muu-muus, Field Test sport shirts, and sundry supercasual attire properly wrinkled for the Big Beachcombers Ball on the 21st. Prizes (four liquid ones) for the two best female, two best male costumes. A fantastic menu (including raw oysters, baked salmon steak, crab quiche Lorraine, and fried shrimp), a fantastic band (specifically *Ernie and the Saints*), and a fantastic (low) price — \$6 per member, \$6.50 per guest. Best of all, August is not the shark season on the C-Club beaches!

CANDLE — light, wine, convivial conversation, Happy Hour bars, a seafood buffet. What more could you want tonight at Happy Hour? You could? All right. We'll throw in great entertainment — the Jimmy Carter Show! (This is the one from Nashville, not the one from Plains.) You'll enjoy them — they're finger-pickin' good. Jimmy, his beautiful sister, his handsome brother, and his drumming brother-in-law start at 8:30. But the seafood will run out before then, so plan accordingly. Get there early.

BURNS — right into your soul That's when it's *110 in the Shade* at Soul Session at 9 on the 14th. (Heels, incidentally, are also welcome at Sole Sessions. Come on out, both

of you.) (Sorry, didn't mean to be arch. Must toe the line somewhere.) (Actually, I never metatarsus I didn't like.)

AT — Happy Hour next week the buffet features pot roast. (No, Alice B. Toklas is not replacing Chef Leonard Garcia; pot roast is braised beef in its own gravy, and it's good stuff.) Dance then or drink in the sounds of the *Nightlifers*. Then mellow out later in the Lounge with Denny, the only guy in the world who plays such intimate guitar that he has to rehearse with the lights out.

BOTH — the live and the celluloid acts are magic at Variety Night tomorrow. First, Bob and Larry Kent and their fine magic act. Then, Disney's *Summer Magic* with Hayley Mills, Burl Ives, Dorothy McGuire. Fine supper-type eating begins at 6; fine summer-type watching at 7. Free to all members — and you don't need a child to get in.

ENDS — at 6 p.m. That's swim time during Picnic Nights on Wednesdays, and we forgot to mention it last time we were mentioning such things. But Picnic Nights deserve mention — they're a great opportunity to enjoy those acres of patio, playground, pools, and picnic facilities. (That's right — no glassware anywhere in there.)

IT'S — sad but true: no Outdoors Indoors in August. So erase it from your calendar and your mind. And just wait till next month!

HARD — to ski in August so the schussers and the sitzmark-makers will gather to rehearse their snow dance, tell tall tales about Lower Hades which have little to do with Dante, and — **prospective members, note** — greet prospective members. Be there for swimming from 5 to 6, snack till 7, then watch inspirational movies and sip inspirational liquids and generally get inspired about skiing. It's the Ski Club's Annual Get-Acquainted Gala, it's open to all, and it's on the 17th.

TO — get a taste of (if not for) the far side of the Iron Curtain, come out for Travelogue

Night at 7:30 on the 18th. Howard Seltzer will show up, off and slides of East Germany, Poland, West Russia, and other non-Disneyland-like attractions. Good show, Howard.

SET — yourself a pleasant task: come watch a movie designed to make you salivate over Canaries (as in Islands). It's on the 9th at 7:30, and it's not *only* for those contemplating the Sept. 23-Oct. 1 trip. (Not much other travel left: maybe a few spaces on the Caribbean Cruise and one or two in Mazatlan. Call the Office quick.)

IT — will be quite a tournament, says Dick Simmons. It's the National Junior Olympic Water Polo Championships at the Club today, tomorrow, and Sunday. Girls' teams from Arizona, Florida, North Carolina; boys' from Kentucky, California, Florida. And, of course, our own Coronado Aquatics Club teams. It's a fun, flashy, fishy sport to watch — come out for the excitement. Six matches today, five Saturday and Sunday.

DOWN — the hatch easily will go any or all of the DOW's for August. This week it's red wine, next Harvey Wallbangers. Beginning the 16th it's an Irish whiskey highball; and finally, good old Lowenbrau.

MY — Commonwealth theatre discount tickets mean I save enough on each ticket to buy a giant hot buttered popcorn. But I don't. That's because I can't eat popcorn, buttered or unbuttered, ever since I got the dentures I wear since Denny took exception to an item in this column. But *you* can probably eat all the popcorn you like — so get discount tickets and enjoy free popcorn. (Look out for Denny though.)

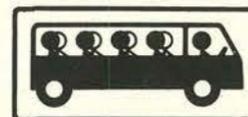
FRIENDS — you are not going to get to swim after 5 on the 21st *unless* you buy a Beachcombers Ball ticket by the 14th. Then you can swim till 11. (You could swim later except that's the time Swim Director John Foster starts skinny-dipping and, in the name of humanity, we close the pools.)

MORE INFO — 265-6791.



**COMMONWEALTH • MAGIC • NIGHTLIFERS • DENNY**

**Bus Notes**



Morning		Evening	
Fifth & Central	7:10	Tech Area Gate 10	4:40
Girard & Central	7:21	Wyoming & Central	4:51
San Mateo & Central	7:28	Louisiana & Central	4:54
Louisiana & Central	7:32	San Mateo & Central	4:57
Wyoming & Central	7:35	Girard & Central	5:03
Tech Area Gate 10	7:45	Fifth & Central	5:15

That's the commuter portion of the "Sandia" regular (not Sandia Special) bus between KAFB and downtown. With new, air-conditioned, lots-of-legroom buses now on most routes, bus riding is more comfortable than it used to be.

But you don't have to be a commuter to ride "Sandia." If you have an errand downtown or at UNM, take the bus: you can catch one on base along Wyoming (not Gate 10) every half hour.

Costs? Basic fare is 35¢ with no zone charges. Tokens are available at many banks (including the Bank of New Mexico here on the Base) at \$6 for 20 rides. In addition, a new commuter pass (available at the SunTran

office on South Yale and at all First National Banks) gives the purchaser unlimited regular route bus riding for a month for \$11.

\* \* \*

Sandia Specials running on time — great. Sandia Specials running a few minutes late — okay. Sandia Specials running a few minutes early — lousy. Some drivers need to be reminded that missing a Special because it's running early means a 24-hour wait, not a half-hour delay till the next one comes along. So if a driver is ahead of schedule (whether in the morning or in leaving Sandia), don't just sit there — bitch. And then call 4-RIDE and report the event.

\* \* \*

South Valley bus riders: twist the arms of non-riding neighbors. Ridership is down again, and if it doesn't pick up, we're in trouble. It's use it or lose it.

\* \* \*

City Special Riders: It's 35¢ cash or a bus pass.