THE SOUND OF MUSIC from the New Mexico Symphony Orchestra Chamber Players filled the patio during lunch last week. Sandians listened, munched on sandwiches, enjoyed the sun, applauded enthusiastically. The Players liked it too and promise to return next fall.

Laser Holography: To Understand Heat Transfer

A new way to study thermal convection in closed containers has been developed by Walt Schimmel of Fluid Mechanics and Heat Transfer Division 1261. Walt is using laser holographic interferometry in an optical measurements laboratory to determine heat transfer coefficients. The research is coupled to an effort to generate computer codes for the prediction of heat transfer coefficients in closed containers.

"We started the work when we were analyzing what might happen if nuclear waste cannisters were deposited on the deep ocean floor," Walt explains, "and this led to analysis of convection fields inside nuclear fuel shipping containers."

"Heat transfer by convection is not a straight-line process — there is circulation of the coolant medium, either air or a fluid. Laser holographic interferometry enables us to observe the process and to gather data which we use to validate the computer codes."

Applications of the codes could be widespread. Convection processes within and around closed vessels are often crucial in the operation of many energy systems, including nuclear, solar and geothermal. Because vessels associated with these systems are extremely large and expensive, an understanding of their thermal convection characteristics is essential before fabrication.

Walt's lab in Building 809 (located in a remodeled women's restroom) contains a helium-neon laser, beam splitter, a test chamber, and associated equipment. Half of the laser beam is projected through the heated test chamber. It is joined by the other half of the split beam and, at the critical focus, the resultant image is recorded on a photographic plate. Typi-
### THE NATIONAL DISASTER SURVIVAL TEST

#### OFFICIAL TEST FORM

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<tr>
<th>I. JUDGMENT</th>
<th>II. KNOWLEDGE</th>
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<th>PRELIMINARY SCORE</th>
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Use this test form to indicate your answers, to total your score, and to compare your score with your family, friends, and other groups.

ARE you a survivor? On May 1 at 7 p.m., NBC-TV and the National Safety Council present the National Disaster Survival Test, which poses various disaster and accident situations together with questions testing your reaction to the situations. Object is to show that even in a total calamity being a winner (or loser) is not so much a matter of luck as of coolness and judgment. Use this form to see how you emerge from the accident/disaster/calamity/holocaust (select one).

#### Events Calendar

**Continuing** — "Mimbreno Art," Maxwell Museum of Anthropology.

April 22 — "Kimo Theatre Event," per-
formances by the Albuquerque Civic Light Opera, Albuquerque Dance Theatre, N.M. Symphony Orchestra, Classics Theatre Co., and others, 8 p.m., tickets and information 843-9486.

April 22 - May 1 — "Divorce Me Darling," Barn Dinner Theatre, 281-3338.

April 23 — "Showboat," KHFM 96.3 FM,
6:40 p.m.

April 23 — Albuquerque Youth Symphony and Youth Orchestra final concert, Popejoy Hall, 7:30 p.m.

April 25 — UNM Symphonic Band concert, Rodey Theatre, 8:15 p.m.


April 30 — "Salute to Irving Berlin," Society for the Preservation of Barber Shop Quartet Singing in America, Convention Center, 8 p.m.

May 1 — NM Mt. Club, hike, lower East Sandias, Western Skies, 9 a.m., 268-4771.

May 1 — UNM Jazz Band concert, Rodey Theatre, 8:15 p.m.

May 3 - June 5 — "The Lady Who Cried Fox," Barn Dinner Theatre, 281-3338.

**DATA FILM** shows results and resolutions achieved with laser technique. Black lines are quantitative isotherms representing constant temperatures around a cylindrical heat source inside a closed container.

*Continued From Page One*

**Heat Transfer Study**

Heat Transfer Study cally, this produces a three-dimensional hologram. Walt is not pursuing three-dimensional data as yet because present heat transfer computer codes are limited to two dimensions.

Walt makes a double exposure on the hologram plate — once at the beginning of the heating process and another when the temperature has stabilized. Because the laser light is refracted by temperature changes, the various temperature gradients are recorded as black lines. The holographic interferogram is then photographed with an ordinary camera, yielding a two-dimensional view of the temperature field. Resolutions of .05 K are possible with the technique.

Another approach is being used by Charles Hickox (1262) to study the velocity field in thermal convection using laser-Doppler anemometry. Laser-Doppler anemometry provides a measurement of the local, instantaneous velocity of tracer particles suspended in a fluid. The relation between particles and fluid must be known, but it is possible to trace particles which follow the fluid motion sufficiently well for accurate measurement. It is a particularly useful technique for the study of recirculating flows.

Data from both labs are used to confirm analytical predictions of the computer codes. Dave Larson (1263) is working on a finite difference code, Dave Garling (1261) on a finite element code. With laboratory verifications, it may soon be possible to predict heat transfer and circulation accurately within many systems incorporating many geometries.

At Sandia the work applies to the spent fuel shipping cask project associated with the Liquid Metal Fast Breeder Reactor. Jerry Freedman (5483) is project manager, and Ron Pope (5483) is heat transfer task leader.

A proposal describing the project and outlining additional research for the universal application of the computer codes to thermal convection systems is now under consideration by the National Science Foundation.
Hartley Serves on International Combustion Project Group

Dan Hartley of Combustion Research Division 8115 is this country’s technical representative to the Combustion Project Group of the Conservation Working Party, an office of the International Energy Agency. The Agency includes 15 member countries, and five of them — Sweden, Great Britain, Italy, Germany, and the US — are currently active in the combustion group. Says Dan, “Our basic goal is to encourage cooperation among the various public and private agencies in each country working to improve combustion efficiency. Avoiding unnecessary duplication and pooling our resources should result in earlier solution to important research problems.” The Executive Committee of this project group is chaired by Karl Bastress of ERDA Headquarters.

Authors


Speakers


Sympathy

To Jim Rogers (8322) on the death of his father in Livermore, Feb. 19.

Dancing By Blueprint — Round Dancing

"A new world was opened for my wife Shari and myself when we learned to round dance about five years ago," says John Helms (8312). "Not only was it something great to do together, but we discovered we had a special knack for the dances.

Now John and Shari are calling for Bay Area dances, doing exhibition dancing and teaching classes weekly. Members of the Northern California Round Dance Teacher’s Association, the Helmses have also been chosen to teach at the California State Convention at Sacramento and are on the teaching staff for the first national round dance festival in Kansas City in July.

Explaining the difference between round and ballroom dancing, John says that, "Round dancing is patterned, sequenced dancing — in other words, ballroom dancing with a blueprint. Instructors must have exceptionally good memories because the patterns and sequences are directed, or cued, for every dance. The couples on the floor all dance in the same line of direction to the cues."

Round dancing is taught in three categories — beginning, intermediate and advanced with music keyed to each category. For an evening of teaching, the Helmses carry along 40 records from each of the categories, plus a microphone, turntable, speakers, amplifiers and a public address system. "I just bought a new $550 turntable for the sound system, so at this point it’s obviously not a money-making hobby," comments John.

When teaching, John handles the microphone and cues, while Shari demonstrates the various floor positions. Shari also makes her own costumes, as well as those of their two teenage daughters, and she spends many hours typing the cue sheets (directions for the footwork for each dance) for use by other instructors.

Both John and Shari play instruments; thus, their musical backgrounds, combined with their footprint ability, contribute to their dancing success. They are also recognized for their talent in creating new choreography to the music of popular songs. In all, the Helmses record for five record labels and, so far, have choreographed 54 dances. The Helmses are quick to reassure would-be round dancers. "Beginning and intermediate levels offer plenty of fun for casual dancers," notes John. "It becomes easy once you learn the basics. And it’s also fantastic exercise."
UNIQUE NEW FACILITY

Sandia's Electromagnetic Environments Simulator

Sandia has thousands of test devices inside buildings. One new building (871, east of 880) is a test device. It's called EMES (electromagnetic environments simulator) and its shape is unorthodox because the building structure is a part of the simulator.

Essentially, the building is a gigantic coaxial cable; technically speaking, it's a truncated, triplate, rectangular coaxial transmission line. From east to west, the facility consists of, first, a source of continuous, pulsed, or transient waves; second, a launcher, or feed, that is a sort of transition from the circular coaxial output of the source to the rectangular coaxial geometry of the facility; third, a pyramid-shaped section of transmission line that gradually increases the cross-section dimension but maintains constant electrical properties; fourth, a rectangular section of transmission line above the test area; and fifth, a tapered output section that absorbs the energy used to excite the line.

The inner walls, the ceiling, and the floor are lined with two layers of highly conductive bronze screen. Exterior walls, ceiling, and floor serve as the line's insulation so that no electromagnetic energy can radiate outside the building. Together the inner and outer walls are the shield for the coaxial cable.

The major test area is a rectangular space 5 m long by 11 m wide by 4 m high. It's big enough that a weapon can stand vertically and be subjected to any of several electromagnetic environments. One of these, EMR (electromagnetic radiation), comes from radio transmitters, radars, and electronic countermeasure devices. These cover the frequency spectrum from kilohertz through gigahertz.

Another type is EMP, the intense, short electromagnetic pulse generated by a nuclear explosion. A third type is that generated by a near lightning strike in the vicinity of the weapon.

Says EMR/EMP Instrumentation Division Supervisor Neith Pollard (9354), "The new facility will play a major role in determining the vulnerability of weapons to these environments. Jim Reed, who conceived the idea for EMES, has tested the concept with a fifth-scale model. If the full-size version performs as well, we'll be able to contribute significantly to weapon reliability."

ARTISTS SKETCH illustrates unique facility whose form is dictated by its function. At right, the electromagnetic wave source. Hanging on dielectric rods halfway between floor and ceiling is a coffin-shaped metallic grid that serves as transmission line. The lower dotted shape indicates weapon being tested. Upper left, some RF absorber cones that attenuate the generated waves.

EVEN DURING CONSTRUCTION, EMES' unorthodox shape was apparent. Building has already attracted the notice of several outside agencies.
Fun & Games

Sandia Bicycle Ass'n. — This is The Weekend for all good bikers and true: show up Sunday morning at 6:30 on the UNM campus at Central & Cornell for the 5th annual Tour of the Rio Grande Valley. Go 50 or go for broke and make the 100 miles. If wind and weather cooperate, it's only mildly excruciating. And besides, you get a patch.

Ralston Barnard (2355) is attempting to persuade the Base military to reopen the Zia Park gate in the morning and afternoon for cyclists. (That's the gate at the end of Ridgecrest SE.) If you would use this gate if it were opened, Ralston would appreciate your letting him know via company mail (no phone, please) so that he can convey to the military some idea of the number of cyclists involved.

Want a traffic signal at Moon and Central? Then come to the Lab News office in Bldg. 814 and sign the petition to that effect which will be presented to city authorities. Walt Joseph (1713) is petition honcho.

Running/Jogging — Les Baumann (3430) reports that he has a good supply of the Brooks Villanova running shoe, which was so highly rated in Runners World. Les is getting $18 a pair, and you can find him at the gym daily after 4:30.

Sympathy

To George (9753) and Virginia Chapman (4358) on the death of his mother in Denver, March 14.

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LAB NEWS
APRIL 22, 1977

How to Get Your Kicks and Lumps

Bouncing across the desert at a bone-crunching 80 mph in a 4-wheel drive vehicle while breathing dust raised by a score or more other mad racers is Ken Campbell's (9342) idea of fun. For three years he has raced a modified Bronco in a dozen events. Next week he will be in Las Vegas competing in the Mint 400.

"The course is in the desert northeast of Las Vegas," Ken says, "four times around an 86-mile marked course. Last year we averaged about 25 mph and came in fifth

NEXT WEEK Ken Campbell (9342) will be in Las Vegas racing his modified Bronco across the Nevada desert in the Mint 400. Ken has been engaged in off-road racing for the past three years.

Off-Road Racing

— hope to do better this year."

Ken enjoys working on the Bronco about as much as racing. "Not as exciting," he says, "but more satisfying."

The Bronco is an assemblage of parts from several vehicles. Ken has added reinforcement to the frame, double shocks to each wheel, reinforced axle housings and a massive double roll bar. The 302 V8 is "fully blueprinted" which means all individual parts are micrometer measured, balanced and polished, and as fine-tuned as a piano.

Ken and his partner — Dan Deaver of Frank's Supply Co. — have been building and racing machines, from motorcycles to drag racers, since junior high days. They got hooked on off-road racing (as it's called) while watching cross-country jeep racing during the T or C Fiesta.

"We put our Bronco together that winter (it's been rebuilt several times since then) and entered the fiesta. Broke a drive shaft after the first half-mile. We entered several races that first year but didn't finish a single one," Ken says. "The following winter we did some really serious rebuilding and had better luck in the next couple of years. We've finished every race and placed a number of times. We took third in the Colorado West 200 two years ago," Ken says, "and first in the Oh-My-God 100 locally last year."

Although he will be pit manager and mechanic and still work on the Bronco, Ken will not be driving anymore. His doctor has called a halt to the activity. Ken has developed back problems.

"It's mighty rugged out there," he says.
Q. I have noted an increasing number of unoccupied government vehicles with the engine running. In addition I have noted: 1) Use of vehicles to go to cafeteria in Building 839. 2) Use of vehicles for personal trips to base Post Office. 3) Use of vehicles for short trips, not carrying materials.

The above adds to pollution and generates unnecessary cost.

A. We appreciate your concern over misuse of government vehicles. In the past years we have published numerous bulletins and articles in the Lab News and have attached notes to trip tickets in order to get cooperation from users of vehicles in connection with the energy crisis.

Security Inspectors are now assisting in controlling this situation by turning off the motor, removing keys and turning them over to the Motor Pool.

As for vehicles found parked at the cafeteria, Credit Union and Post Office, it is almost impossible to police this type of misuse. However, on the dashboard of every vehicle there is a sticker indicating the penalty for unauthorized use of government vehicles, and we can only assume that operators are aware of this penalty. Further, any specific reports of misuse are investigated by Motor Pool personnel.

D. S. Tarbox - 3400

Q. Which of the Memorial Days [National or New Mexico] will Sandia observe? In 1977 they will be on the same date. The N.M. Legislature has ruled that Memorial Day will be observed on May 30th every year in this state.

A. As you noted, there is no problem in the observance of Memorial Day in 1977 as both the National and New Mexico observance will be on Monday, May 30, 1977. There have been reports that there may be action by the United States Congress to return Memorial Day observance to its traditional date as the New Mexico Legislature did. If no such action is taken, it is our current intent to observe Memorial Day in 1978 and future years on the same day as do the Military and ERDA on the Base.

F. P. Prange - 4100

Q. The Sandia Bulletin dated 7-14-76 outlined the holiday schedule for 1977 and succeeding years. It stated that the Christmas holiday would be "6 days beginning with Christmas and ending with New Years." Which days are involved?

A. The Christmas Week holiday period will consist of six workdays beginning with the workday observed as Christmas and ending with the workday observed as New Year's Day. Since both Christmas Day 1977 and New Year's Day 1978 fall on Sunday, these days will be observed on Monday. Thus, the coming Christmas Week holiday period will be December 26, 1977, through January 2, 1978.

F. P. Prange - 4100

Q. Is Sandia considering, or has it considered, a four-day workweek? I ask this in light of President Carter's remarks concerning the fuel crisis.

A. The Laboratories does not have any current plans to implement a four-day week as an energy conservation measure. The amount of energy savings of a ten-hour four-day week compared to the present eight-hour five-day week is debatable. In addition, there are Federal statutes which require the Laboratories to pay overtime to certain types of employees who work over eight hours in a day.

F. P. Prange - 4100

Q. Re: Allowance in lieu of lodging. Please explain the policy of allowing only $10/night with a maximum of 2 nights/trip.

A. Employees are expected to utilize commercial lodging facilities when performing business travel and to obtain receipts therefor. The Laboratories does not encourage employees to stay with friends or relatives or does it permit vouchering for such accommodations at commercial rates, or for more than one or two days per trip. However, the Sandia "gratuitous allowance in lieu of hotel expenses" does permit an employee to stay with relatives or friends, and reimburses the employee for the out-of-pocket cost of a token gift or meal for the host and/or hostess in appreciation of their hospitality. The current allowance of $10 a night or $20 a visit should be adequate to cover this type of expense even in today's economy.

C. R. Barncomb - 3200

Q. A separate material requisition form [MR] must be prepared for each of the following groups of stock numbers for electronic parts.

100,000 thru 209,999
300,000 thru 359,999
800,000 thru 899,999
600,000 thru 631,999
632,000 thru 649,999

Recently I ordered 32 items of electronic parts. This would or rather should require just two MR's because there are nineteen lines on an MR, but due to the above requirements this order took five MR's. Isn't this excessive?

A. General Stores is relocating the electronic items you mention into two areas, one of which will contain the series Stock Numbers 600000 through 649999 and all other series will be in the second area. This will require just two MRs instead of the five you previously processed.

L. S. Conterno - 3700

Q. Three times recently I've heard of a talk given on the USA vs. Russia arms race. Who is eligible to attend this sort of presentation and how does one get on the mailing list?

A. Crawford MacCallum of the Sandia Colloquium Committee says that the talk on the arms race has not been videotaped at the request of the speaker. It has been given three times and interest continues, so it's possible that it will be done again. Announcements of Colloquia are sent to all MTSs and all division supervisors and above at SLA. For colloquia that are classified — as the one on the arms race is — tickets are available on a ratio of one to eight, i.e., only one out of eight eligible people will be able to attend because of the size of the auditorium. Your best bet is to ask your supervisor to help you arrange for a ticket.

J. R. Garcia - 3500
Solar Irrigation Pump

SUN POWER — Water, Willard and the Estancia Valley east of Albuquerque are elements in this solar powered irrigation project directed by New Mexico State University and Sandia Labs. Solar reflectors are source of heat energy that ultimately drives motor pumping water into pond. Water is later used for irrigation. Willard and other small towns in valley were active farming communities in early 1900’s, raising mostly pinto beans, but dry weather and changing farm economics led to decline.

Authors


C.E. Barnes (5133) and K.J. Soda, “Application of Damage Constant in Gamma-Irradiated Amorphous Si Doped GaAs LEDs,” Vol. 23, No. 6, IEEE Transactions on NUCLEAR SCIENCE.


T.A. Dellin (5154) and C.J. Macek (5154), “Analytical Photo-Compton Deposition Profiles,” Vol. 23, No. 6, IEEE Transactions on NUCLEAR SCIENCE.

E.P. Erciyes (5155) and S.T. Picraux (5111), “Role of Integrated Lateral Stress in Surface Deformation of He-Implanted Surfaces,” Vol. 48, No. 1, JOURNAL OF APPLIED PHYSICS.


A.C. Watts (1321), “Nonreduced Optimal Observers,” JOURNAL OF APPLIED PHYSICS.

CHARLES CHARLIE CHANG (5242) and A. WISNIEWSKI (5122), from the University of New Mexico's Semiconductor Development Lab. Dr. Phil Day and Phil Eaton of UNM's School of Medicine and Center (Bill Spencer, Director of microelectronics (2100).

The Insulin Pump: Hope for Diabetics

The severe and debilitating condition of diabetes may someday be relieved by a new insulin pump, electronically controlled, that has been developed in Bill Spencer's Microelectronics Directorate (2100). The pump is a striking example of technology spin-off—the application of weapon technology to a non-military, humanitarian purpose.

Implications of the new device are far reaching. Diabetics are estimated to number 5% of the population, with some 10 million in the United States alone. While insulin controls the disease, the care is far from complete, and blind diabetes may someday be relieved by a new insulin pump, electronically controlled, that has been developed in Bill Spencer's Microelectronics Directorate (2100).

In its early state, the insulin pump was small enough to be implanted, even as a cardiac pacemaker is now implanted. The unit's insulin reservoir and batteries would be rechargeable internally. Other elements include a peristaltic pump and valve mechanism, and the electronic controls and programmer. The pump is the key component, since it regulates insulin flow, and it will incorporate miniaturized integrated circuits similar to those developed in Sandia's Semiconductor Development Lab.

At the present time, a miniaturized external version of the insulin pump is being tested with a diabetic dog at UNM's School of Medicine. Experiments with humans, using the external pump, have also begun. The experimental program is expected to run for several years.

Dr. Phil Day, Eaton and Schade, and Phil Eaton at the School of Medicine are principal medical contributors to the insulin pump program. At Sandia, Dr. Spencer, Wayne Cortese, Rod Dominguez and Blynn Shafer (all of 2100) are concerned with the technical design and development of the pump and control system. UNM is requesting a $5.5 million grant from the National Institute of Health for research in several areas of diabetes. Part of the money would be used to support human experiments at the School of Medicine, as well as supply some small funding for work at Sandia.


J. NADEAU (1951), "Emergence of Solar and Optical Exposures," invited seminar, Battelle Colombus Laboratory, March 28, Columbus, Ohio.

L. S. BREAU, W. G. PERKINS and D. R. BOGOS (all of 1944), "Formation Vapors from the Aeronautics of Atlanta, Georgia, R. B. BOSCA, "Beam in Metal Triclinic," University of Wisconsin-Madison Materials Science Laboratory, March 21, Madison.


J. S. ROBERTS (1924), "Tandem Use of the NOS (1951) and Computer Committee, April 18, Minneapolis.


J. NADEAU (1951), "Emergence of Solar and Optical Exposures," invited seminar, Battelle Colombus Laboratory, March 28, Columbus, Ohio.

Programmable Light Display Invented

A simple solution to a complex display problem has resulted in a patent for ERDA, Harry Mason (1720) and Marcel Schiena (1715) have invented a programmable light display system for use where the display of signals — on, off, a map or diagram — from remote sensors is a prime requirement. The problem with any display system on which you want a point on a map to light up when something happens is twofold," says Harry. "You either build your grid of lights to scale the pitch of your map or drugs the map to match your grid. So each display becomes a custom job. There was no flexible universal system. We looked at some very expensive grids before we built the solution.

The conception is being used in a number of military and ERDA security systems and in some nuclear safeguards programs. Lightweight portable units are being built for field application.

Recently patented programmable display system is invented by inventors Marcel Schiena (1715) and Harry Mason (1720).

Mary Hall (941)

Mildred Hinds (1952)

Gordon Goekill (962)

Russ Fremeryn (2711)

John Watkins (1300)
Take Note

Org. 5100 weekly seminars for the next two weeks are as follows: Apr. 26, "An Overview of Radiation Effects in Optoelectronic Devices" by Charles Barnes (5153); May 3, "Ionic Conductivity in Li$_3$A$_{10}$ and LiOH" by Ralph Johnson (5155). Seminars are held in Bldg. 306, room 201 at 3:15 p.m.

The New Mexico Committee on Children and Youth is seeking parents of handicapped children to serve on a panel that would advise the Committee about the needs, problems and availability of special education and other services to handicapped children. The panel would also act as a resource for other parents with handicapped children. Interested persons should call Thomas Griffin, coordinator for the Committee, on 842-3049.

Patricia Davis (9570) is active in the Vortex Theatre, a fairly new drama group that performs in a small and informal theatre at 106A Vassar SE. Patricia reports that she is directing Deathwatch (by Genet) and The Lesson (by Ionesco), two one-act plays that will be performed on Apr. 28, 29 and 30 at 8 p.m. This weekend, the 22nd, 23rd and 24th, Vortex presents Marat/ Sade. Admission is $2.50.

If kiddies drive Mom up the wall during summer vacation, consider the Children's Summer Movie Series. Sponsored by the Epilepsy Foundation and the Louisiana Foundation, the Series offers a G-rated movie every Wednesday morning for ten weeks beginning June 15. Cost of a ticket for the entire series is only $6.50, and proceeds go for a good cause — The Epilepsy Foundation. Call the Foundation on 298-8901 for tickets.

A more cerebral outlet for youthful energies is being offered this summer by UNM's Modern Language Department. Summer classes in conversational German for children and young adults will meet twice a week starting June 21. The class is limited to 10 students, cost for the 16 sessions is $50, and the contact is J. Winter at 294-1359.

Trout Unlimited, a non-profit fish conservation organization, holds its annual banquet Friday, April 29, at 6:30 p.m. at the Airport Marina Hotel. Speaker will be Ernest Schwiebert, noted fly-fishing authority, who will present "Rivers of Patagonia." Tickets, $12.50 each, are available from Bob Kindley (4342), treasurer, or Don Spatz (4341), past president.

ARTS AND CRAFTS SHOW — Bob Sharp (9751) will exhibit his hooked rug creations and Doug Ballard (9531) his watercolors at the National Arts and Crafts Benefit, sponsored by the Albuquerque Chapter of the Council for Exceptional Children, April 30 - May 1 at the Agricultural Exhibits Hall, State Fairgrounds. More than 100 artists and craftsmen from a six-state area have entered the event. Admission is $1, and proceeds further the work of the non-profit organization.

Spring Forward

Daylight savings time starts this weekend — at 2 a.m. Sunday. Set your clocks one hour forward.

The conservation world and the Forest Service world are at odds (again) over the issue of wilderness designation for 30,700 acres of the Sandias, and 37,000 acres of the Manzanos. The issue is controversial, but if you are interested in Albuquerque's backyard mountains, you may want to get more information. Little published information supporting the Forest Service position is currently available, but the Gila Headquarters at 10308 Candelaria NE has copies of the original 1964 Wilderness Act and of the Land Use Plan under which the mountains are now managed. For an advocacy approach to the wilderness designation, come to a Sandia Mountain Workshop tomorrow and Sunday at Sandia School, 532 Osuna Road NE. The workshop includes discussions and hikes to nearby Sandia Mountain areas (bring hiking boots or shoes, water, and sack lunch); registration is at 8:30 a.m. and costs $1.50.

Bus Note

Good news for Sandia Special #3 riders: Sun-Tran and the Parks & Recreation Department have finally agreed that the Arroyo del Oso Golf Course parking lot can be used as a park-and-ride location. Drive there, ride the bus to work.
We've Got a Lot of Namesakes Out There

Non-residents (and a few who live here) can't spell it, and it rhymes with jerky, murky and perky, also turkey in case you want to write a song about the place. It's our home is Albuquerque, and a retired Sandian—J.J. Miller—has come up with more data on the name than most people want to know. Save, of course, Albuquerqueans.

Did you know, for example, that the Lisbon phone book lists 350 people named Albuquerque? Strangely, though, Portugal has no place named Albuquerque. Albuquerque, Spain, is the home of the duke for whom our city was named. It's located in western Spain, has about 10,000 people.

J.J. has also established that there's never been a St. Albuquerque. And the Albuquerque phone book lists no Mr./Ms./Mrs. Albuquerque. His collection of maps that somewhere say “Albuquerque” is probably the world’s largest, making it a candidate for Mr. Guinness, and we have reproduced a few of them at right:

1. This Albuquerque is a town of 6000 on one of the Phillipine Islands. It was probably named after a Spanish missionary who was active there in the late 1500's.
2. Albuquerque, Spain, the duke's home town.
3. A Brazilian encyclopedia lists 70 people-type Albuquerque's, and the country has at least seven Albuquerque place-names. This village is located in the Brazilian state of Mato Grossso. Number 4, another village, is in the state of Rio de Janeiro. And number 5, Sa. do Albuquerque (Sa. = scerra = mountain), describes a mountain range 60 miles north of the city of Rio de Janeiro.
4. Bahia Albuquerque is a minor bay on the Strait of Magellan in southern Chile.
5. A “cayo” is Spanish for key or reef, and two Cayos de Albuquerque are located off the Nicaraguan coast. The U.S. Sailing Directions lists them as “two small cays 4' and 6' high, about 300 yards apart.”
6. The Britannica in the LAB NEWS office, a venerable 1940 edition, says of this Albuquerque: “The bracing climate and the large proportion of sunny days have given it a reputation as a health resort.”
7. A “cayo” is Spanish for key or reef, and two Cayos de Albuquerque are located off the Nicaraguan coast. The U.S. Sailing Directions lists them as “two small cays 4' and 6' high, about 300 yards apart.”
8. The Britannica in the LAB NEWS office, a venerable 1940 edition, says of this Albuquerque: “The bracing climate and the large proportion of sunny days have given it a reputation as a health resort.”

Retiree Deaths

Jan - March 1977

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<th>Name</th>
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<td>Pernt Dwyer</td>
<td>Jan 23</td>
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<td>Warren Elder</td>
<td>Feb 11</td>
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<td>Jack S. Emby</td>
<td>Feb 28</td>
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<td>Orvalle Graham</td>
<td>Jan 8</td>
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<td>Marvin Lee Harvey</td>
<td>Jan 18</td>
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<td>John Lambie</td>
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<td>Adam Manzanares</td>
<td>Mar 19</td>
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<td>Russell Merrell</td>
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<td>Jose Montoya</td>
<td>Feb 25</td>
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<td>Honorato Sanchez</td>
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<td>Donald Saunders</td>
<td>Feb 7</td>
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<td>Alexander Thom</td>
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<td>Hug Wallis</td>
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<td>Henry Williams</td>
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<td>Orval Wray</td>
<td>Mar 20</td>
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<td>Louis Wannoni</td>
<td>Mar 26</td>
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Resident Sandian

In Carlsbad See Joe Magruder

Joe Magruder (1135-1) is our man in Carlsbad. For the past 19 months Joe has been Sandia's Resident Representative for the Waste Isolation Pilot Plant project.

The proposed plant with underground storage facility would be located at a site about 48 km east of Carlsbad. Joe provides administrative and logistic support to the technical effort at Carlsbad. Wendell Weart (1140) is project manager.

Joe does a lot of shipping and receiving of material and handles purchase orders for services and material from local suppliers. In addition to the Sandia office at Carlsbad, Joe is responsible for two warehouse locations. And, for the considerable Sandia traffic to and from Carlsbad, Joe and secretary Rachel Jackson (1135) assist with travel reservations, motels and local transportation arrangements.

Joe is a member of the Carlsbad Chamber of Commerce and is active in Rotary and Elks Clubs.

"This is a PR activity," Joe says. "I meet Carlsbad civic officials and leaders, and I can direct their questions about WIPP to Wendell's group in Albuquerque or arrange for WIPP presentations at meetings."

Joe and his wife Diane enjoy living in Carlsbad, a city of 27,000 people.

"Great people here," Joe says. "We like Carlsbad city pride, the city river park, fishing in the Pecos river and hunting for artifacts in the boondocks."

Joe joined Sandia in August 1956 and has worked in Purchasing and the Medical organization.
Hydroponics

Look, No Dirt!

Red, lucious tomatoes year round that’s what hydroponics can do! Not to mention lettuce, beans, cucumbers and strawberries.

Tom Pace (9420) grows all his salad vegetables in a 10’x10’ green house in his backyard. The system is completely automated, turns into the hydroponics bed three times a day. Heating and air conditioning systems control temperatures inside the greenhouse. He grows his own plants in water tanks once a week - one teaspoon of nutrient per gallon of water.

The hydroponic beds are made from 2x8 lumber lined with plastic and filled with a mixture of vermiculite and perlite. Plant roots spread easily in the mixture. Pump holes are installed over the beds to distribute the nutrient fluid. “Feeding time” is about 45 seconds. Once a year Tom pulls out old plants and changes the vermiculite/perlite in the beds.

Sand or pea gravel could work as well. “Hydroponics is merely gardening without human soil. Many commercial greenhouse systems are making use of this technique for commercial gardening throughout the world. SupplyЯs need to be made and suppliers are easy to find. Tom says he has also made use of this system for his backyard garden. Tom says, “I did all that work for fun.”

Tom’s wife Elise gives the greenhouse plants day-to-day care. “I enjoy it,” she says. “In the winter I occasionally sit in the warm sunshine inside the greenhouse and read. There’s very little care required - prune a few leaves here and there.”

Tom plans to add another 10’x10’ addition to the present greenhouse. His heater and air conditioning systems can handle it.

MISSCELLANEOUS

ADDS MACHINES. 25 b $3.50, Zo- cuska, 881-4886.

AQUARIUM, salt water, 125 gal with stand, double filtration, $450. Includes sea animals, fish & coral. 866-4666.

AWNING, 9’x12’, $50. 298-3235.

BAR, 36”x96”, 1” top, black laminate, 2” bar rail, 24” stools; $120. 298-5555.

BUSHHAMMER, 30”, $300. 293-5757.

CARTON PAPER, 40’, 20’ hr hot for semi; $1.50 per 1000. 298-9728.

CYCLE EXERCISER, Vita Master, speedometer, odometer, tension control, padded seat. Ludeke, 286-0365.

MOVIE CAMERA, 8 mm, Japanese, 1200, $200. 293-6327.


FURNITURE, 4’x8’ x2’ Tuscany, Dr (Holiday Park). 292-6851.

ORGAN, Baldwin 72L, Panasonlc or spinet. 292-6851.

ENGINE, 1500 cc. ’90 Toyota Corolla. 293-1887.

RETRACTABLE STICK for camping or hunting. 2, $30. 292-3697.

CARPET, 65 sq yd, wool. It gray, 11’x70’, take all 1100; 8 yd gray, 11’x70’, take all 1100; 14 sq yd beige, 11’x70’. 298-3502.

WINCH14 made, ratio 10-1, powered by two 12 volt batteries. 200 ft. 200# capacity. 298-3502.

IN-OUT-OUT ELECTRIC TYPewriter, proportional space. For trade only. 298-3502.

PRINTING, make, 10 ratio, powered by two 12 volt batteries. 200 ft. 200# capacity. 298-3502.

SHEETS, 550. 2% 1-50 sheets $1, 51-100 sheets $2. 298-3502.

CAR, 1965, Ford Fairlane, 2 door, manual transmission, 136,000 miles, rust free, runs good. 292-9598.

REAL ESTATE

1.2 ACRE ACREAGE in southwestern Colorado, wooded, borders National Forest, across highway from Purga
town ski area. Contact: 217-3598.

APARTMENTS, 14 units on West 10th, $250 each month, living, 10% utilities. 298-1217.

TIVOLI Quality 4-bedroom, 1 landscaped lot, Hays, 3 bedrooms, 2 bath, $295. 292-3487.


FOR RENT

1 BD APT, patio, laundry, furnished - unfurnished, Ask price, utilities paid, $155/250, 296-5809.

2 BD RM, 2nd floor, right neat, $190, 294-3327.

PROFESSIONAL SUITES, for ’84 Mustang & 70 Mercury, Har. 292-8893.

PROPANE TANK, 20 gal liquid gas container, 150 lb. cylinder, $15. 298-3199.

WANTED

HOME, for free puppies, see Irish sable and white, $200, 821-9663.

MAINTENANCE MANUALS, for ’84 Mustang & 70 Mercury, Har. 292-8893.

PROFESSIONAL SUITES, for free puppies, see Irish sable and white, $200, 821-9663.

PROPANE TANK, 20 gal liquid gas container, 150 lb. cylinder, $15. 298-3199.

WANTED

FLOOR JOINERY, CARPOOLERS from Loma del Norte or Academy Acres area to Area 1. 294-4207.


LOST AND FOUND

LOST - Cherie, small female poodle, vitamin, grey, brown ears, nose, pink collar, last seen Charleston ST., could be worth $100. 298-6209. evenings, small cross made of nails. on green corduroy roundie, five keys in brown case. Mickey Mouse watch with wristband; bicycle coil cable with small master lock; b-focal safety glasses (A) photo lens with dark rim rim in case; Peach, safety sunglasses with wired back; b-focal glasses with black rim; b-focal watch with Hopi band.

FOUND - Silver automatic pencil (C, 0.5 mm), 298-3502.

LANYARD with key ring (plug of drum & file, 298-3502.

MARSHALL, 30 Min., 5-1/4" key ring; faceted-colored screw-type pendants in 2 colors, 298-3502.

L LOTE, water abundant, each lot with well, restrictions for your protection. 293-3502.

OPEN HOUSE, 708 TUXEDO BLVD. BIKE, 296 oc, street legal, Dold, 293-3487.

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## SWIM LESSON

Have exactly a fortnight and a day to pick up tickets for May's Saturday Night the-cob, and more. qued beef, barbequed chicken, corn-on-sea, and Firewater former ticket holders get their old familiar feet. in that order - eat the meat, then beat the

## HAPPY HOUR

**BBQ BEEF & CRAB**

**HAPPY HOUR**

**SHOES.**

**SAFETY**

**MEETING,**

**AWAY TO ENTER WITH. ACCEPT A CALIFORNIA**

**THE** - Happy Hour tonight features beef stroganoff, crab newberg and Shalako in that order - eat the meat, then beat the feet. Shalako's a new group to the Club. Don't confuse them with the Zuni group of the same name. This group lets

## LEARN

- to swim, kids. Sign them up tomorrow, parents. Be at the Club between 9 a.m. and noon with a season ticket (on sale in the lobby), and enroll your tots, teens, or inbetweeners in the appropriate Red Cross-approved swimming class. They could learn the butterfly stroke (butterflies soaked or basted too. Tickets are now available in the office.

## FATHER

- or mother or both ought to pick up tickets today or tomorrow for their progeny who want to attend the Disco Teen Dance tomorrow night. Emceeing the event will be real live record-spinning professional Rice Dustin. Come on out, all your real live record-loving professional teenagers!

## DISAGREEING

- with the notion that you Sanadoes a-thinkin you'd never, ever attend a social event with the notion that you don't like the music. Now that we're getting away from the subject of the Grand Canyon, let's talk about the simple things. Like dancing, listening, munching, talking, competitive games (and others), and a Happy Hour bar. Fifty cents at the door from the Ballroom to the Patio.

## SON

- of a gun! Travel Director Ed Neidel has just announced four (4) new travel packages to three (3) destinations. Not all the details are available yet, but watch for later announcements. One of the new trips is a 12-days-in-Alaska plane-train-bus-ship jaunt beginning August 28. It includes the Yellowhead Route from Seattle to Prince Rupert by bus; then a ferry up the Inside Passage to Skagway; then narrow-gauge railroad across the mountains to Whitehorse, capital of the Yukon; fly then to Fairbanks and visit all the sights in that fantastic city; then a bus through the McKinley National Park (8 hours) and on to Anchorage. Fly back. Remember Pipeline Paradise forever.

## FATHER-

- average everyday ordinary everyday Singles Night it's not. It's a big all-Sandia- and-ERDA-singles-invited Patio Party on First Friday, May 6, from 4:30 till 7 or so.

## CRAWL

- OILS • CRAB • HOEDOWN •