

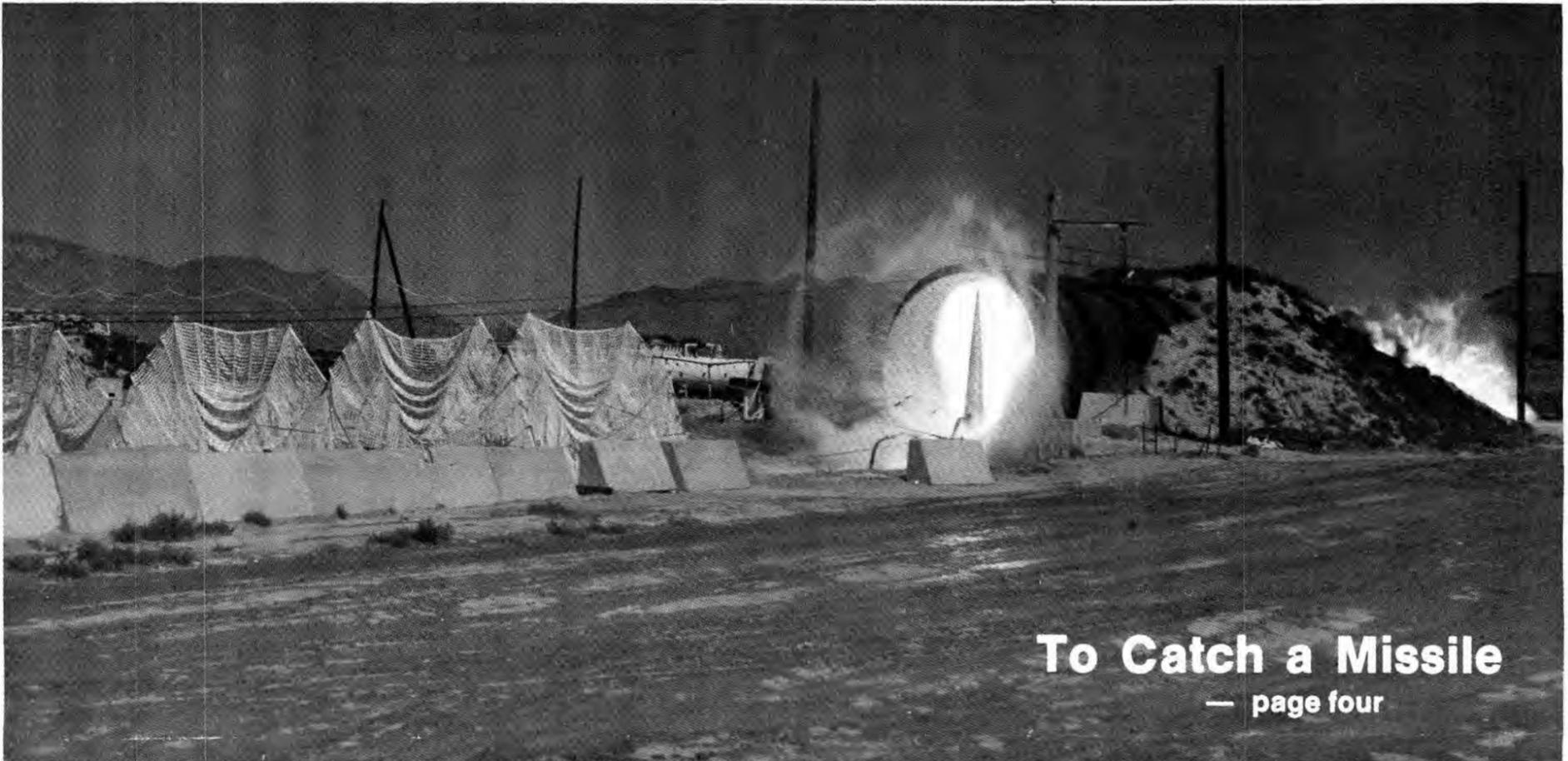


LAB NEWS

VOL. 25, NO. 23

NOVEMBER 16, 1973

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



To Catch a Missile
— page four

Energy Source

Coal & Oil Fracturing: A Labs Proposal

The necessity for developing new energy sources has resulted in several proposals for the in-situ (or in-place) processing of fossil fuels that cannot be economically recovered by conventional methods.

One energy-related proposal that Sandia has prepared for AEC consideration (LAB NEWS, Oct. 5) concerns the in-situ fracturing of coal and oil shale deposits. The in-situ fracturing is required to make a formation permeable and to create appropriate degrees of fragmentation necessary for either in-situ gasification or remote mining.

"At the present time coal can be converted into methane and oil shale into petroleum products in above ground processing plants," says Wendell Weart, supervisor of Underground Physics Division 1111, where work on the proposal is centered. "Sandia can help recover our vast coal reserves by providing a process that would make it possible to fracture large bodies of coal deep underground. The fragmented coal could then be burned in place, under controlled conditions, to produce a useful high-energy-content gas."

Sandia proposes to combine several techniques into an effective fracture and fragmentation process. Because it is important to orient a fracture from one well toward another, directional energy sources such as shaped charges are proposed for the initial fracturization. Hydraulic fracturing techniques could then be used to extend initial fractures and to create a fairly extensive crack pattern in the coal seam. This pattern would

be loaded with a high-explosive slurry or liquid which, when detonated, would produce a system of interacting shock and rarefaction waves through the coal seam. After the seam is fragmented, it would be ready for in-situ processes.

In the Sandia proposal, the synergistic effects of both hydraulic and explosive techniques would be exploited to fragment coal and oil shale formations in a controlled manner. Results should bring a thorough understanding of in-situ fracture phenomena and, for demonstration purposes, an actual coal or oil shale formation would be prepared for in-situ processing or remote removal.

Surface subsidence will also be investigated, and Labs studies of subsidence from underground nuclear tests will be applicable.

Although this phenomenon does not figure to any extent in the fracture process, the ability to predict and control subsidence is important when material is removed from a deposit by any in-situ process.

Sandia's findings on in-situ fracturing would supplement both the LLL proposal for in-situ coal gasification and the gasification field test being conducted by the Bureau of Mines at Hanna, Wyo. The fracture results would also be a valuable contribution to experiments being performed by commercial petroleum firms on the in-situ processing of oil shale. An additional benefit of fracturing coal is the release of large volumes of methane gas in underground coal mines. Recovery of this methane gas would bring about a

significant conservation of a resource now being wasted.

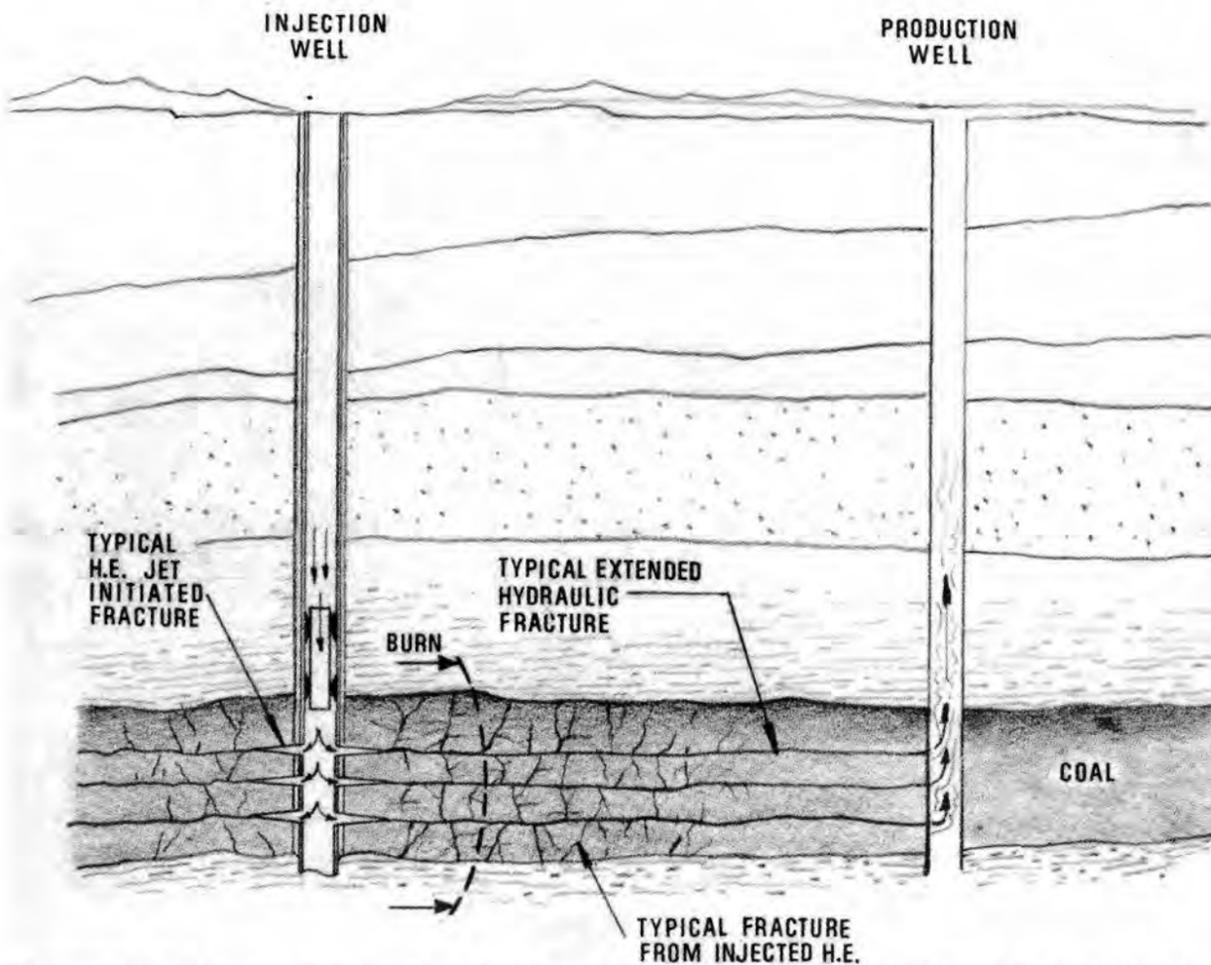
Sandia Labs is well qualified to pursue these investigations, Wendell says. "Our application of numerical programs and computers to the study of stress wave propagation and rock fracture — an outgrowth of work at NTS — is unexcelled. Lab facilities which can establish the properties of the coal and oil shale are now being used to determine the equivalent properties of materials in the weapons programs. Our people are familiar with field test and underground mining techniques — a very important part of this effort. Weapon test experience in underground instrumentation will be invaluable in the effort to gain data from in-situ experiments. And the study will be further aided by

(Continued on Page Two)

ECP '73

The 1973 Employees Contribution Plan was virtually complete this week with only a few cards untabulated. Sandians contributed a whopping \$361,284 to the 35 agencies of the Albuquerque United Community Fund and eight other national health and welfare agencies.

Some 81 percent of Sandians contributed to the drive, 47 percent at the Fair Share level. Average gift of those who contributed was \$82.86.



ARTIST'S SKETCH shows how a fractured deposit of coal might be burned under control in place to extract a combustible gas. Amount of oxygen entering the well would control burning rate. Oxygen enters from the injection well, gas is withdrawn from production well.

Continued from Page One

Sandia Can Help Recover Our Last Coal Reserves

underground instrumentation development programs at Sandia."

Pending an AEC go-ahead, current efforts on the proposal are modest. Related field studies are being conducted at Nevada Test Site by Lynn Tyler (1111) using the hydraulic fracturing technique to determine in-situ stresses for containment purposes. Others participating are Bill Vollendorf and Hank Kerr (both 1134).

Al Stevens (5133) is developing data on coal and rock fracturing using numerical techniques developed in the study of spallation in metals.

Other proposals by Sandia which will complement the fracturing study are being pursued by Jay Benson (1115): "Instrumentation Systems Development for In-Situ Processing"; and Carl Schuster (1235): "Techniques for Underground Fracture Mapping."

"We are prepared to make useful contributions during this fiscal year," Wendell says, "and to mount a full-scale experiment next year. All we need is the green light — and the money — from AEC." • dg

Sympathy

To Sam Baca (9550) on the death of his father in Alamogordo, Oct. 24.

To Mike Garcia (7515) on the death of his brother in Denver, Oct. 18.

LAB NEWS

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An Equal Opportunity Employer

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TONOPAH, NEVADA

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bruce hawkinson writes
as does norma taylor while
bill laskar takes/makes pictures

&
in livermore lorena schneider does all

JUST IN CASE of major accident or catastrophe at the Labs or KAFB, an Emergency Rescue Trailer is ready, thanks to Harold Jeblick (9542). He has had both Sandia's trailers (one at Area III, one at Area I) completely refurbished — tools, supplies, and necessary labeling so that the trailers and rescuers can respond efficiently to almost any kind of accident, especially one which involves freeing victims from a wrecked building, plane, or other vehicle. The Scott Air-Pak Harold is holding permits a rescuer to breathe inside a smoke-contaminated room.



Sympathy and Congratulations

If there's a birth or death in the immediate family of a Sandian, LAB NEWS will carry the item if someone will tell us about it — a co-worker, supervisor, or any interested person. Just give us a call.

Take Note

The Kirtland East Recycling Center has been moved from its former location southwest of the commissary to the area directly east of the Thrift Shop, south of the Bank of New Mexico. For newspapers there is a fenced-in enclosure with pallets inside.

Please segregate all recyclable materials, placing clear, green and brown glass and steel cans into the dumpsters so marked. Place trash in the trash container and don't leave boxes or bags filled with glass or trash on the ground.

* * * *

Salary and Benefits Administration Division 4213 is now located in Bldg. 800, Room 107. The Equitable Life representative is at this location as well. Telephone numbers have not changed.

* * * *

Bake sales for Christmas projects have already begun. Marge Miller (3151) reports that their group is offering baked goodies at modest prices on Mondays — Nov. 19, 26 and Dec. 3, Bldg. 892, Rm. 268. Proceeds are donated to the South Highway 14 Village Project.

Technical Society Meetings

ASQC — Nov. 20, Tradewinds Motel, 7 p.m., Speaker — Les Ball (NASA), "The Quality Assurance Engineer's Responsibility for Product Safety."

Authors

Walt Bauer (8334) and Ron Musket (8313), "Study of Aluminum Oxide Films by Ion-Induced X-Rays and Rutherford Back-Scattering," JOURNAL OF APPLIED PHYSICS, Vol. 44, June 1973.

Ben Odegard (8312) and Tony Thompson (formerly 8313), "The Influence of Microstructure on Low Temperature Creep in Ti-5 Al-2.5 Sn," METALLURGICA TRANSACTIONS, Vol. 4, pp. 899-908.

Ray Mar (8314), "Conditions for Formation of ErB_6 ," JOURNAL OF AMERICAN CERAMIC SOCIETY, Vol. 56, pp. 275-278.

Walt Bauer (8334) and George Thomas (5522), "Helium Re-emission and Surface Deformation in 316 Stainless Steel During -170°C to 700°C Implantations," JOURNAL OF NUCLEAR MATERIALS, Vol. 47, p. 241; "Helium Implantation Effects in Palladium at High Doses," RADIATION EFFECTS, Vol. 17, p. 221.

Hartmut Spetzler (8314), and L.O. Heflinger and R.F. Wuerker (both TRW), "Thermal Expansion Coefficient Measurements of Diffusely Reflecting Samples by Holographic-Interferometry," REVIEW OF SCIENTIFIC INSTRUMENTS, Vol. 44, May 1973.

Michael Soderstrand (8182) and Sanjit Mitra (UC/Davis), "Design of Active RC Filters with Zero Gain-Sensitivity Product," IEEE TRANSACTIONS ON CIRCUIT THEORY, July 1973.

Jack Dini (8312) and Ron Musket (8313), "Applications of Auger Electron Spectroscopy in Electroplating," PLATING MAGAZINE, August 1973.

Bob Schmieder (8342), "Double and Triple Photon Decay of Metastable 3P_1 Atomic States," PHYSICAL REVIEW, Vol. A7, p. 1458 (1973).

Bob Schmieder (8342) and Harvey Gould and Richard Marrus (LBL), "Lifetime of the 2^3S_1 State of Helium-like Argon ($Z = 18$) and Helium-like Titanium ($Z = 22$)" PHYSICAL REVIEW LETTERS, Vol. 31, p. 504 (1973).

Speakers

Ken Marx (8341), "Numerical Treatment of Multiple Dielectric Relaxation Times in an Irradiated Transmission Line, IEEE Annual Conference Nuclear and Space Radiation Effects, Logan, Utah, July 23-26.

Tony Thompson (8313), "Ductility Losses Due to Hydrogen: Current Research and Future Directions," Seminar, Department of Metallurgy and Materials Science, Massachusetts Institute of Technology, June 25.

Dan Hartley (8364), "Application of Laser Raman Spectroscopy to the Study of Factors that Influence Turbulent Gas Mixing Rates," and Pete Witze (also 8364), "A Generalized Theory for the Turbulent Mixing of Axially Symmetric Compressible Free Jets," ASME Joint Applied Mechanics of Fluids Engineering Conference, Georgia Institute of Technology, Atlanta, June 20-22; also published in the ASME FLUID MECHANICS OF MIXING.

Wes Estill (8312), Don Benthussen (8342), and Hilary Jones (8314), "Practical Aspects of Electron Microprobe Computerization," Eighth National Electron Probe Analysis Society of America, New Orleans, Aug. 13-17.

Congratulations

Mr. and Mrs. John Barnhouse, Jr. (8442), twin sons, John Newman, III, and Donald James, Sept. 1.



LIVERMORE NEWS

VOL. 25, NO. 23

LIVERMORE LABORATORIES

NOVEMBER 16, 1973



"HAVE SOME FUN — drive our bus." That's what you guys told me.

Third Cross-Country Trip

Sandian Drives Bus for Teenage Drum & Bugle Corps

"Driving a bus load of teenagers across the country to appear in national drum and bugle competition wouldn't appeal to many people as a way of spending three consecutive vacations," says Merle Snyder (8412), "but I like it."

Back in 1971 when the Commodores, a youth drum and bugle corps from his home town of Stockton needed a bus driver for their first major trip, Merle volunteered. Now, three trips later, he sometimes wishes he were 15 again so that he could be a regular member of the group — age limit is 21.

With a membership of over 100 teenagers from the central San Joaquin valley, the group is currently composed of some 48 horns, 17 drums, 10 rifles and 28 flags. The director and executive director volunteer their services, while the various part-time instructors are paid. Parents of the teenagers chaperone the trips.

The group is financially supported by the Stockton police department, the American Legion Post, local businesses and organizations, and the Commodores parent-booster club. In addition, the teenagers sponsor fund raising projects during the year to cover travel expenses over and above the cost of their food, which they pay for themselves.

The City of Stockton won the Valley Forge Freedom Foundation national award last year, and Merle is convinced that the city's program of youth activities — including the Commodores — was a factor.

This year they traveled over 9000 miles and performed at major shows in Lexington,

Ky., Boston and Lowell, Mass., and Whitewater, Wisc. At each location the Commodores were one of the 12 corps selected by the judges out of 40 to 50 entries to appear in the final show. A special highlight of the trip was a performance on the steps of the Capitol in Washington, D.C.

"Of course, problems occur," Merle notes. "On the Pennsylvania Turnpike last summer, as I followed the director in his camper, we inadvertently went in the wrong direction and I then made an unlawful U-turn. Just as we made the turn, there was a state trooper waiting. That cost us 14 bucks.

"Later on, outside of Washington, my bus had a major engine breakdown. Luckily, we managed to get another to continue the trip.

"Traveling with over 100 teenagers is a great experience," concludes Merle. "There are the times when their antics can really bother you, but then the same antics help make the time pass quickly on those long, 12-hour stretches."

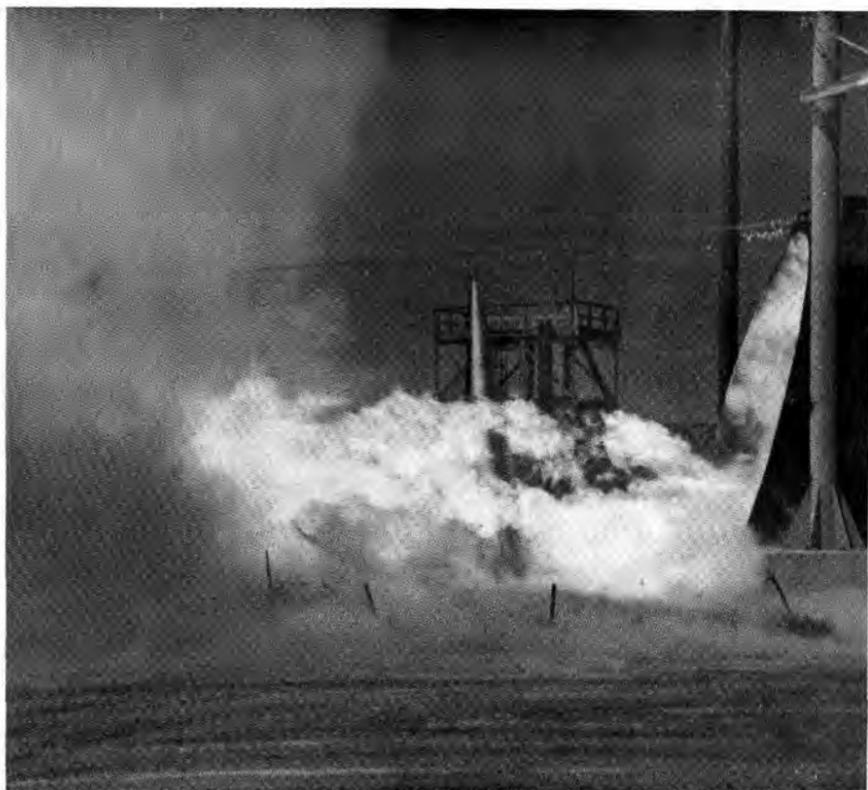
Sympathy

To Vera Chandler (8433) on the death of her father in El Paso, Texas, Oct. 30.

To Pauline Kirk (8161), Edith Milatzo (8260) and Mary Milatzo (8431) on the death of their mother in Cheyenne, Wyo., Oct. 30.

To Gordon Van Gundia (8163) on the death of his son-in-law in Copperopolis, Calif., Oct. 20.

To Hilary Jones (8314) on the death of his mother in Danville, Oct. 21.



WHOOSH, and away she goes. Tunnel is capable of generating supersonic flows at muzzle end.

FROM the inside out, this view shows 19-foot muzzle end of shock tunnel and Sprint missile in place for test.



To Catch A Missile

Manny Vigil, project engineer in Coyote Test Field Division 9322 and designer of the Labs' big shock tunnel (305 feet long), had a problem. The shock tunnel was doing nicely, shocking the bejabbers out of various test units with explosively driven blasts. Data obtained helped predict the performance of these vehicles when subjected to the shock of detonation from, say, another missile.

But when the shock wave hit, the test unit — a pretty good size hunk of metal (note photo) — would take off across the mesa in the general direction of Phoenix. Recovery was quite a production and, well, it just didn't seem appropriate for this big object to be

given free rein once it left the shock tunnel. OK, how to stop it?

Manny's solution is elegant, albeit bedraggled in appearance. The pictures show the series of parachutes, salvaged from one of the older weapon programs, arrayed like Mrs. Murphy's laundry outside the muzzle end of the shock tube. Lateral lines are attached to concrete blocks. When the tunnel goes BOOM, the unit sails into the chutes which quickly halt its westward flight. In a business where costs are usually (a) high or (b) very high, the retired-parachute-certified-missile-catcher probably sets some sort of record — on the low side that is. Manny, do you think it has any commercial possibilities. •js



DESIGNER Manny Vigil (9322) didn't have a name for this collection, so it's been dubbed the Retired Parachute Certified Missile Catcher.

Events Calendar

- Nov. 16-18 — Rio Grande Arts & Crafts Show, Albuquerque Convention Center.
- Nov. 17 — NM Mt. Club, Ancho Canyon, 8 miles, Gulf Mart, 8 a.m.
- Nov. 17 — Concert: Three Dog Night, Univ. Arena, 8 p.m.
- Nov. 17 — Football: UNM vs. Wyoming, UNM Stadium, 1:30 p.m.
- Nov. 18 — NM Mt. Club, Del Agua Canyon, 8 miles, Gulf Mart, 9 a.m.
- Nov. 18, 25 — Hockey, Tingley Coliseum, 7 p.m.
- Nov. 19 — ASUNM Lecture Series, Angela Davis, Popejoy Hall, 8 p.m.
- Nov. 20-21 — Albuquerque Opera Theatre Presents "Die Fledermaus," Popejoy Hall, 8:15 p.m.
- Nov. 22 — Korean Children's Choir, Civic Auditorium, 7:30 p.m.
- Nov. 23 — Cultural Entertainment Series: The National Players, "The Comedy of Errors," and on Nov. 24 — "Tartuffe," 8:15 p.m., Popejoy Hall.
- Nov. 25 — NM Mt. Club, Penasco Springs, 6 miles, Gulf Mart, 8 a.m.
- Nov. 29-Dec. 2 — International Rodeo Assn. finals, Tingley Coliseum, 8 p.m., Sat., 2 p.m., Sun., 2:30 p.m.
- Through Dec. 2 — Museum of Albuquerque, "Crafts 5."

Congratulations

- To Mr. and Mrs. George Laramore (5151), a son, Jason David, Oct. 28.
- To Mr. and Mrs. Don Larson (5625), a son, John Michael, Oct. 7.
- To Larry (1241) and Molly (4712) Ellis, a son, Scott Jacob, Oct. 19.
- To Mr. and Mrs. Samuel Wallace (9533), a son, Brian Allen, Nov. 7.

feed *back*

To get a response to your comments and questions about Sandia Labs, complete a Feedback form (available near bulletin boards) and return it to the Feedback administrator. The substance of questions and responses of wide interest is published in LAB NEWS.

Q. Rumor: Sandia Laboratories will not be operating during Christmas week. Fact or fiction?

A. A shutdown for Christmas week has been considered by Sandia but to date has not been adopted. Principal reasons: (1) the continuing interface between the Laboratories and the AEC, other laboratories and the military, and (2) the disadvantage to individuals since a shutdown would tend to cause them to reduce their summer vacations in order to cover the shutdown period.

The Laboratories will be open for operation during Christmas week. It is expected that many employees will take vacation during that period; therefore, most services will be significantly reduced.

— D.S. Tarbox (4200)

* * * *

Q. Rumor has it that the graded personnel of Sandia Laboratories will soon be under Civil Service. Is there any truth to this?

A. There is no basis for a rumor that Sandia Laboratories will come under the jurisdiction of the Civil Service Administration.

For your information, negotiations of the terms and conditions of a five year renewal of the Sandia Contract are now being carried on by AEC, Western Electric and Sandia.

— C. T. Ross, Jr. (6000)

* * * *

Q. Why are there no women on the board of directors of the Sandia Credit Union?

A. Candidates for the board of directors are selected by the nominating committee from among those expressing an interest and willing to serve on their own time. No women have expressed such an interest since 1962 when the last woman board member declined to seek re-election, nor have any women been nominated from the floor at the annual meetings.

— Earl Simonson (4122)
President, Sandia Laboratory
Federal Credit Union

* * * *

Q. Since Sandia seeks new contract work, has any provision been made for reception of suggestions from individuals throughout the Company?

A. The question is both important and timely! A significant factor in the Laboratories' vigor and health is the continuing generation of new ideas in all our activities. There are currently two ways of getting a suggestion looked at: (1) Submission through line supervision; and (2) Feedback. Which route to follow is up to the individual. We are also considering other ways to stimulate new ideas and to assure that those submitted receive prompt attention. Organizations (8000 and 5000) have already begun a campaign to seek new ideas; a Laboratories-wide campaign will soon be initiated with similar objectives.

— D. B. Shuster (4700)

Q. Someone's going to be killed in the north crosswalk between buildings 892 and 894.

There is a small sign high on a post, west of the street instructing vehicles to stop for pedestrians, but drivers rarely choose to obey it and whiz down the street far in excess of the 15 mph limit.

At least two solutions exist: (1) take down the sign so we know we're fair game, (2) put signs in the middle of the street in all crosswalks, or (3) enforce the intent of the one sign by revoking a few licenses.

A. As a result of your inquiry concerning this crosswalk, Safety Standards, 9542, is re-evaluating all crosswalks within the Tech Area. Work orders are being prepared to redesignate some crosswalks and to erase others. New crosswalk signs will be installed at appropriate locations.

— L. J. Heilman (9500)

* * * *

Q. (From SLL) Why not set up containers in lab areas to dispose of the aluminum cans from the soft drink machines? They could be sold and the funds used for some worthwhile project.

A. We've checked this out and find that if all 480 cans that are dispensed weekly were salvaged, the return on the estimated 22 pounds of aluminum would be \$2.20 (10 cents/pound). Labor costs of collecting and delivering the cans to a distribution center would far exceed the money collected. However, if an interested employee wishes to pursue such a project on his or her own time, I'd be happy to discuss ways and means with that person.

— C.H. DeSelm (8200)

* * * *

Q. Where do they bury Sandia Labs employees' contributions in the UCF box score reports? Why are they buried at all? Labs employees account for about 20% of the UCF goal this year. Why not a little positive PR for a change?

A. Like other contributors, Sandia Laboratories employees' contributions become a part of one of several major soliciting divisions. In our case, it happened to be the largest division — the Pacesetters. There is no intent to bury any organization contribution, but there is intent to group contributors on a practical soliciting and reporting basis.

In any event, Sandians do receive recognition. Community leaders are well aware of the magnitude of our contributions and frequently mention its significance in the overall picture. In addition, our level of personal effort in UCF is widely cited as an example to be followed.

Further, our own publications, mainly LAB NEWS, help keep employees informed on their ECP (and UCF) efforts, and many copies of LAB NEWS are routinely mailed to community leaders. Finally, I can assure you that our continuing record of support has not gone unnoticed by the people who need help and by the UCF agencies themselves.

— K.A. Smith (3100)



JOHN KELLY (5242) displays unique geometry of his new electron beam generator, recently patented. The device is used in connection with Sandia's REBA accelerator.

Kelly's Electron Beam Generator

The AEC has been issued a patent for an electron beam generator invented by John Kelly of Electron Beam Physics Division 5242.

"By their nature," John says, "electron beams are hard to focus. This patent covers a device which concentrates the area of the beam by a factor of 10 — an improvement at least as good as any in the field."

John designed a generator which used a unique geometry to achieve a pinch in the beam. The beam from an emitter shaped like the edge of a cup is fired between two concentric cones which guide the beam current through the drift tube and induce a return current in the walls of the tube. Half of this return current is then brought to ground back through the emitter. This action stabilizes the beam by eliminating the magnetic pinch force in the channel and in the diode.

"There were a couple of problems limiting the usefulness of the device," John says. "First, some of the beam electrons possess angular momentum around the axis and can not be focused. And, second, the plasmas launched from the electrode surfaces for the small anode/cathode gap required tend to short out the diode."

"However," he continues, "this device pointed the way toward some very promising approaches for future work."

FUN & GAMES

Sandia Golf Association (Women)

The SGA(W) annual awards banquet was held last month at the Four Seasons. Pat Anderson (9415) was named the 1973 Association Champion and Rose Hainlen (retired) was the 1973 President's Cup Winner.

Low gross awards went to Ann Michele (3100/7500) for scheduled play during the summer and in the Los Altos 36 hole tournament. Rose Hainlen earned the low net trophy for scheduled play during summer and the low gross for play on the UNM South course. Other low net awards went to Clara Gearhart (3141) and Lillian Mancuso (3321). Low putt trophies were presented to Alma Mischke (4152) and Betty Chappell (AEC/ALO).

Officers elected for the 1974 season are Lena Valerio (1111), president; Kathy Pitts (2331), vice president; Gloria Martinez (AEC/ALO), secretary; and Edwina Kiro (5623), treasurer.

* * * *

Bowling Tournament

The Sandia Labs Bowling Association's 10th annual handicap tournament will be held at Fiesta Lanes on Dec. 1-2. Events will be team, singles and doubles, and all events. Submit entries to Bob James (2634) or Reba Garrison (5710) before Nov. 30.

* * * *

'73 Flag Football Wind-Up

The Odd Squad (7000), coached by Howard Sanchez (7131), competed in the City Parks and Recreation League as a member of the National Green League. They took first place with a won/lost of 10-0. The Blues (5000), coached by Dave Johnson (5245), were members of the National Blue League and tied for fourth place with a 6-4. The Belen team, coached and quarterbacked by Buddy Sanchez (2631), also played as members of the National Blue League and finished in second place with 8-2.



PSYCHO-CYCLIST — Unless your bike has turn indicators, use hand signals early and every time you're turning. Sharon Erickson (5112) demonstrates a proper left turn signal. The Local Looney tries a straight arm.

Sandia Runners Association

SRA sent a check for \$144 to the Intensive Care Unit of St. Joseph Hospital in the name of Dennis Mottern, our late chairman tragically killed in a bike accident. The sum was donated by members. A copy of the transmittal letter has been sent to Sheila, Dennis' widow.

Jim Harrison (4731) has agreed to succeed Dennis as chairman. His platform: "Gas pumps dry? Let 'em run . . ." Well alright. See Jim if you wish to check out one of the two SRA stopwatches.

Here's the Road Runners schedule: Nov. 18, Burton Park (Carlisle & Kathryn SE), 2:05, Men's Novice, 3 miles; 2:30, Men's Open, 2 miles; 2:45, Women's Run for Your Life, 1/2-mile; 2:50, Men's RFYL, 1-1/2-miles; 3:05, Women's Open, 1-1/2-miles; 3:15, Men's Intermediate, 1 mile.

Finally, this quote from *Science* sent to us by Arlin Cooper (2126): "The American Medical Joggers Assn. has been unable to document a single death resulting from coronary heart disease among marathon finishers of any age." In case you've forgotten, the marathon is 26 miles, 385 yards.

* * * *

Chess

The Sandia Labs Chess Club has its next regular meeting Monday night, the 19th at 7:30 in the El Dorado Room of the Coronado Club. Non-members are welcome too.

* * * *

Sandia Bicycle Association

SBA Pres. Billy Thorne reports on his recent meeting with KAFB authorities: "Ropes across Sandia Dr. — to be taken care of soon; Wyoming Gate — probably can get paved bike path on west side 'immediately', extending from gate to 30th St.; traffic light at 7th and D (SE corner Parade Grounds) — to be installed some time after Jan. 1; Zia Park gate — slim chance."

In the wake of Dennis' death from head injuries suffered in a car/bike accident,



DON MATTOX (5526) climbs mountains and rides a bike, and it turns out that his Mountain Safety Research helmet received highest grades in study conducted by Gordon Pike (5155) of headgear suitable for bike riders (see writeup). Don finds helmet-mounted light especially handy since rider can point beam in desired direction.

Gordon Pike (5155) has undertaken a considerable investigation of helmets suitable for bike riders. His complete findings have been documented and will be included as a supplement to the next SBA newsletter. Gordon has concluded that the helmet pictured here with wearer Don Mattox offers as good protection as can reasonably be attained. He states: "This helmet is relatively light, quiet, and combines shell air holes with a web suspension to yield adequate ventilation . . . Without question it offers the most protection of any helmet so far examined (except for full coverage motorcycle helmets)."

The helmet, manufactured by Mountain Safety Research, runs about \$20, but Gordon can get a quantity discount that brings the price down to \$16.15 plus shipping costs. He's already sent in one order. Call him if you're interested.

Touring — The Mountain Club is having a bike tour on Sunday, Nov. 18. Meet at Gulf Mart at 8 a.m. if you wish to go. They're heading toward Bernalillo.



PAT QUIGLEY, supervisor of Design Information Development Division 7633, recently accepted an award presented to Sandia for outstanding contribution of technical reports to the Government-Industry Data Exchange Program (GIDEP). GIDEP provides a system for collection and dissemination of engineering data on parts, equipment, materials and processes. At Sandia complete GIDEP files, the responsibility of Division 7633, are maintained at Design Information Centers in Bldgs. 836 and 892. At Livermore, GIDEP files are in library.

Speakers

P.H. Holloway (2431), "The Influence of Surface Roughness on the Excitation and Detection of Auger Electrons"; R.S. Berg, G.J. Kominiak and D.M. Mattox (all 5526), "Incorporation and Behavior of Helium in Sputter-Deposited Films"; R.L. Park and D.G. Schreiner (both 5114), "Oxidation of Carbon Monoxide on Palladium"; J.A. Panitz (5514), "The Crystallographic Dependence of Field Desorbed Species"; A.R. DuCharme (5156) and R.L. Gerlach (Varian Associates), "The Role of Coster-Kronig Transitions in the Ionization of Surface Atoms"; G.E. Laramore (5151), "Analysis of Low-Energy Electron Diffraction Intensity Profiles from the (100) and (111) Faces of Copper"; E.P. EerNisse (5112), "Extension of

the Double Resonator Technique"; L.C. Beavis (2413), "Vacuum Science and Technology Today," National Symposium of AVS, Oct. 9-13, New York, N.Y.

C. Arnold, Jr. (5511), Invited Paper, "Development and Characterization of En-7 — A Ferric Acetylacetonate Catalyzed Polybutadiene-Based Elastomer," 1973 Fall Meeting of the Rubber Division of the American Chemical Society, Oct. 9-12, Denver.

R.J. Eagan (5316) and G.J. Jones (5531), "Reaction of Glass with Silicon and Silicon-Germanium Alloys," Glass Division Meeting of the American Ceramic Society, Oct. 10-12, Bedford Springs, Pa.

R.A. Langley (5111), "Range-Energy Relations for C Ions and O Ions in N₂, O₂ and Tissue Equivalent Gas (Neutron Radiation Microdosimetry)," Joint Meeting of American Industrial Hygienist Association (Rocky Mt. Section) and Health Physics Society (Rio Grande Chapter), Oct. 11-12, Albuquerque.

W.H. McCulloch (1543), "ASCE (NM section) Fall Meeting, Oct. 12, Los Alamos.

R.E. Cuthrell and D.W. Tipping (both 5331), "The Bonding Characteristics of Gold in Ultrahigh Vacuum," Annual Holm Seminar on Electric Contact Phenomena, Oct. 15-18, Chicago.

P.H. Adams and A.V. Farnsworth (both 9331), "Strain Gage Problems in Carbon-Composite Materials Testing," Technical Committee on Strain Gages of SESA, Oct. 16, Indianapolis.

W.H. Dodson (2116), "Radiation Tests on MNOS Memory Arrays," Hardened Guidance and Weapon Delivery Technology Meeting, Oct. 16-18, Orlando, Fla.

A.W. Johnson and J.B. Gerardo (both 5212), "The Vacuum-Ultra-Violet Molecular-Xenon Laser"; F.M. Bacon (2412), "An Experimental and Theoretical Investigation of the Anode Plasma of a Pulsed Vacuum Arc," Annual Gaseous Electronics Conference, Oct. 16-19, Madison, Wis.

N.J. DeLollis (5513), "Hydrogen Evolution from Adhesives," ASTM Committee D-14 Meeting, Oct. 17, Denver.

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

CLASSIFIED ADVERTISING
Deadline: Friday noon prior to week of publication unless changed by holiday.
A maximum of 125 ads will be accepted for each issue.

RULES

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Laboratories and AEC 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

56,000 BTU forced air furnace w/thermostat control, L.P. or natural gas, \$25. Doggett, 299-7957.

TIRE CHAINS, 6.40-15 through 7.35-15, \$10; ladder jacks & scaffold, new, \$20. Carnicom, 281-3421.

SINGER sewing machine, zig-zag, cabinet model w/decorative stitch discs, attachments & instruction booklet, \$80. Brooks, 268-5449.

METAL highchair, \$8; seat type chalk board, \$4; child's card table set, \$8; queen headboard, \$10; stereo cabinets, \$50; doll stroller, \$1. Longfellow, 299-7062.

ROCK TUMBLER, 2-spd., 1 1/2-lb. & 2 1/2-lb. hexagonal rubber lined barrels, extra liners, gaskets, grit, \$50. Womelsduff, 299-6269.

FOUR NEW L60x14 tires; 15x6 Corvette rally wheels w/rings; misc. small block Chevy parts; Holley four barrel. Sena, 294-1680.

TOY POODLE, silver male, 6 wks. old, registered, \$125. Shipley, 298-2433.

ITT port. AM/FM/FM stereo radio, walnut case, 3 speakers (2 detachable), AC power supply, \$200 new, sell for \$75. Schkade, 293-7453.

ELEC. SPRAY GUN, \$30; raise up camper for pickup, sleeps 2; water tank & pump, ice box & cabinet, \$400. Lackey, 898-5175.

FRIGIDAIRE Imperial, white, 9.5 cu. ft. refrig., 4.8 cu. ft. bottom freezer, \$75. Marrs, 299-3865.

SKIS, Head 360 205cm, Tyrolia bindings, \$25; children's buckle ski boots, size 12, \$7; child's wood skis, \$5. Toepfer, 296-6758.

2 EA. F78-15 Goodyear Polyglas tires mounted on 15" '62 Rambler Wheels, \$15. Dolce, 296-4033.

ICE SKATES, Canadian CCM Mustang hockey skates, size 9 1/2, \$25. Smailer, 299-8413.

1200X16.5 8-PLY TRUCK tire, \$5. Stephenson, 299-3914.

CB RADIO, antenna, AC/12 volt adapter, \$35; new queen box springs, \$85; equalizer trailer hitch & elec. brake control.

Lassiter, 298-2461.

LUDWIG DRUMS: super classic set w/extra floor tom, sparkle silver pearl w/paiste cymbals, \$395. Schimmel, 296-2295.

DOUBLE OVEN, elec. stove, Roper brand, timed bake ovens, 15 mos. old, harvest gold, \$175. Navratil, 293-5527.

5-VOL. SET of shop manuals for '64 Olds, \$5; 2 new rear shocks for '63-'64 Olds, \$5. Berg, 299-5640.

GREAT PYRENEES puppies. Stevenson, 265-9081.

RABBITS, 6 wks. old, \$2; Sears diaphragm type paint sprayer, never used, \$25. Weaver, 299-0245.

SPORTS EQUIPMENT: 185cm skis w/stepin bindings, \$10; bowling ball, bag & 8 1/2 D shoes, \$10; Exergenie exerciser, \$6. Burgess, 296-4254.

AQUARIUM, 10-gal. complete outfit, \$15. Carlson, 299-6610.

BILTRITE baby carriage, \$90 new, sell for \$40; baby's playpen, \$5. McGuire, 345-0539.

KEESHOND purebred puppies, silver & black, like small Huskies, similar to Elkhounds when mature. Rose, 298-4849.

16 GA. WINCHESTER mod 12, pump, make offer or trade for .22 cal. target. McHarney, 255-7883.

CONTEMPORARY 5-pc. dining room set, 4 cane-back chairs, 44" round table w/3 leaves. Cole, 255-8227.

WALL HEATERS, gravity flow 25,000 BTU, single wall, \$35; 50,000 BTU double wall, \$45; T-frame back pack, \$3. Sutherland, 266-1734.

TRAVEL TRAILER, 17 1/2' Holiday Sport, 1970, fully self-contained, all the extras, Easy-Lift hitch & sway bars, \$2000. Yarbrough, 255-4087.

CRIB w/ mattress, \$15; push mower, \$5; tire chains, \$3; ski pants, man's size 30, child 6. Miller, 265-0029.

6'x9' AREA RUG, mandarin red-orange, \$35; woman's size 8 1/2 steel-toe hiking boots, \$6; B&G Christmas plates, 1964-73, make offer. Benson, 296-4282.

MEMBERSHIP Flying 8 Club; C-182 well equipped, \$12/hr. wet, C-150 good trainer, \$6/hr. wet. Ford, 294-6133, Johnson, 299-4383; Griffith, 299-6271.

10'x5' REDWOOD gate, \$5. Peabody, 296-6239.

DISHWASHER, port. 4-yr.-old Kenmore, 2 temps., top-opening, \$70. Longcope, 292-2141.

2-HORSE TRAILER, tandem wheels, good tires, spare rubber mats, saddle rack, wired, \$750. Morris, 877-3782 after 5:30.

MINIATURE SCHNAUZERS, AKC

show quality. Sanchez, day 298-7513, eves. 294-7226.

HAIR DRYER, port.; kitchen scales; wiglet, real hair; combination canister. Pearce, 265-9170.

OLD SCHOOL DESKS from 1-rm. country schoolhouse, small size. Russell, 298-4949.

MATTRESS & box springs, full size, \$20. Plummer, 296-0806.

ENCYCLOPEDIA Americana: 1959 edition plus annual year-books through 1969, total of 40 volumes, w/two bookcases, \$100. Taylor, 821-2964 after 5:30.

LUGGAGE RACK, \$12; model A/C engine, \$3; sink, \$5; medicine chest, \$7; toy hydraulic building set, \$3. Porter, 299-5480.

PLAYPEN; Gerry pack; car bed; walker; black vinyl bucket chair; hanging highchair; short wig, frosted & case. Self, 296-4137.

SOFT WATER SYSTEM, 5' tank, needs repairs, \$25. Hawk, 265-2228.

SHOPVAC, 5-ga. size, used 1 week, \$18. Guttman, 299-7031.

KEYSTONE 8mm projector; S&W model 41; Winchester 70 cal. 225; heavy leather chaps; Zuni necklace; misc. Indian jewelry. Zaluga, 344-1564.

2 SPRINGFIELD 30-06 rifles, \$80 ea. Larsen, 268-7880.

LARGE Early American copper hanging light fixture, \$15. Wemple, 298-4485.

BUMPER motorcycle carrier, fits Honda 90, \$20; sliding glass door, 8' wide, heavy glass, \$25. Wilkinson, 299-8327.

SNARE DRUM, Slingerland, pearl, new case & head, stand & music, \$75; children's 135cm skis, Jr. Cubco binding, 2 pr., \$15/ea. Schellenbaum, 299-1005 after 3.

ELECTROPHONIC stereo/AM-FM-Multiplex/8-track tape deck, headphones, tape carrying case, 34 tapes, stand, \$225. Keeling, 268-2275.

SKI EQUIPMENT: Youth metal skis 120cm, \$40; Look step-in bindings, \$20, set \$50; man's med. heavy down parka, alp. yellow, \$30. Stevens, 299-6086.

TRANSPORTATION

'71 HONDA 350 street, 6000 miles. McConnell, 255-2488.

'73 LEMANS spt. coupe, AT, PS, PB, AC, 9400 miles. Simmons, 299-3823.

'62 FORD stn. wgn., \$300, 4 new tires, recent brake job; boy's 5-spd. bike, banana seat, high-rise handlebars, \$45; girl's std. bike, \$25. Willa, 298-0435.

'68 OLDS 4-dr. Delta 88, PS, PB,

AC, Positraction cruise control, make offer. Rayner, 299-7429.

'65 BONNEVILLE, 4-dr., AC, heater, PS, PB., tilt wheel, PW, radio needs work, \$200. Mashburn, 299-9102 after 5:30.

'71 HONDA SL175, 4300 miles, \$450. Kavet, 265-2788 or 299-1797.

'67 CHEVELLE wagon, new seat covers, elec. back window, PS. Armijo, 298-7980 after 6.

'72 YAMAHA Enduro 175cc, 420 miles. Lee, 281-5496.

'64 CHEVELLE, 4-dr. sedan, 283 CI V8, AT, one owner, 70,000 miles. Moyer, 2916 Florida NE, 255-8807.

BICYCLE, 2-yr.-old Schwinn Continental, \$80. Moscow, 299-7356.

'69 YAMAHA Trail 80, 2928 miles, buddy seat & pegs, \$150. Arave, 298-3702 after 6.

'66 INTERNATIONAL PU, lwb, V8, 3-spd., new clutch-brakes-alternator, many extras, \$600. Scranton, 299-4902.

'67 DATSUN stn. wgn., AT, 23 mpg, \$795 or best offer. Parmley, 821-2006.

'69 BUICK Skylark, PS, AC, \$1150. Wallace, 296-6556.

'66 CHEV. WAGON, AT, PS, PB, 6-pass., power everything, Blue Book or will consider reasonable offer. Scully, 299-1083.

'72 FORD Gran Torino, PS, PB, AT, AC, metallic-ginger-brown, under 35,000 miles, many extras. Herrera, 268-4775.

'65 PLYMOUTH Valiant; '60 Ford 1/2-ton pickup; '72 Opel 1900, below book, any reasonable offer considered. West, 281-3460.

'66 CHEVROLET pickup, 1/2-ton, wide box, 3-spd., highest offer. Trujillo, 255-5053.

'65 CADILLAC Sedan de Ville, 4-dr., all power, cruise control, 6 good tires, \$500 firm. Mead, 299-2396.

FORD ENGINE, V8, 272 cu. in., 45,000 miles, \$95. Kohut, 298-0695.

'73 NORTON 750 Commando, \$800 and take over payments; '60 T-Bird, loaded, \$300. Hal, 265-3531 before 5 p.m.

'59 FORD, \$100. Harstad, 298-6551.

'70 HODAKA ACE 100, \$100. Barton, 265-8607.

'66 VW BUS, deluxe model, 8000 miles on factory rebuilt engine. \$895. Davenport, 255-3523.

REAL ESTATE

3-BDR., DR., 1 1/2 bath, carpet throughout, lg. yard, new VA loan, \$18,000. Lerma, 299-6289.

CORRALES AREA: 4-bdr.

territorial on 3/4 acre, paneled den w/fp, 2 1/2 baths, 2500 sq. ft., built 1972. Buckner, 898-4390.

WANTED

SKI BINDINGS, Marker Rotomat, heel only. Stamm, 255-2640.

TRADE Selmer Bundy saxophone (tenor) for bass guitar. Burleson, 266-9389.

MODEL of the Mace Missile. Miller, 255-7716.

PRINT DRYER & other photographic darkroom equipment. Fisher, 299-9235.

TWIN SIZE bed w/mattress & box springs; also matching dresser if available. Lewis, 296-7896.

USED SKIS, metal or fiberglass, 170-180cm (5'7" - 5'11"). Tjeltweed, 299-0032.

TRANSPORTATION for a horse to Cuba, N.M., for the elk hunt, Nov. 23-27; can afford \$20 trailer rent or hauling fee. Snowdon, 344-4637.

SHOES are needed for poor people in Torreon & Manzano; any size, need not be new; South 10 Village Project. LAB NEWS office, Bldg. 832.

.22 CAL. match target rifle, Rem. or Win., testing privilege necessary. McHarney, 255-7883.

USED BABY grand piano. Knutson, 299-6183.

PAIR of good ski bindings. Fite, 255-6943.

FOR RENT

1973 TIOPA/DODGE motor-home, completely self-contained, 4-sleeper; fall/winter rates 20% off daily or weekly rates. Wetherholt, 299-5736.

WORK WANTED

14-YR.-OLD girl is saving money for European tour with classmates: babysitting wanted evenings and weekends. Schuler, 298-9824.

NEED after school work for two, clean, neat, dependable teenage boys. Hansen, 869-2716.

LOST AND FOUND

LOST — Rx sunglasses in case, 2 Ford keys on beaded key chain w/red plastic disc. Zippo lighter, car & house keys on ring. LOST AND FOUND. Tel. 264-3441, Bldg. 832.

FOUND — Man's glasses w/clip-on sunshades, keys w/tag printed "Souvenir of Greece." man's watch. LOST AND FOUND. Tel. 264-3441, Bldg. 832.

Coronado Club Activities

Mexican Food Tonight

SPECIAL EVENTS DIRECTOR Bill Swartz (9424) and his crew of hardworking spooks, monsters and witches did an outstanding job for the 300-or-so little goblins celebrating Halloween at the Club. The House of Horror was truly that — gruesome is too mild a word. Dr. Frankenstein's lab with flashing lights, spark gaps and chemical flasks was fantastic. When the monster came to life, the kids were convinced and left screaming. Well done, crew.

* * *

TONIGHT, HAPPY HOUR features the Club's great Mexican food buffet, Frank Chewiwie on the bandstand and Denny Gallegos entertaining in the main lounge. Next Friday, Nov. 23, will see an oriental food buffet spread, Wildman Bob Banks on the bandstand and Yolanda Adent in the main lounge with a song-fest. On Friday, Nov. 30, Sol Chavez and the mighty Duke City Brass will play for dancing, a French buffet will be served, and Denny will entertain onstage in the dining area in the late hours of the evening.

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TEENAGERS can do their thing on Saturday, Nov. 24, with dancing and stuff from 7:30 to 10:30 with something called Morning Star wired into the bandstand. A KQEO disc jockey will emcee the bash. Member parents should pick up tickets for their youngsters.

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CORONADO AQUATICS CLUB will be taking orders for holiday goodies during the months of November and December. You may place your orders for pumpkin pies, breads, cakes, candies, cookies or cheeseballs by phoning Pat Meyer, 296-6606, or Mary Navoda, 299-5273. Proceeds will finance swim team activities.

* * *

A GOOD DATE for an organizational Christmas party at the Club is Friday, Dec. 21. The Club could arrange for a party upstairs or downstairs for your group. Call the office, 265-6791, for details.

ASSORTED MONSTERS cavorted at the recent Club Halloween party. Below, Bill Swartz (9424) gets friendly with a witch named Cherry. Bars could never stop Max Newsom (5724) as the wolfman. Far below, Don Burns (2336) as the mad scientist assisted by Don Grab (2331) bring life to monster John Willems (1525).



SWINGERS Kip Stanley (7112) and Pat Carrillo (AEC) are anticipating three swinging Friday night Happy Hours in the next two weeks at the Coronado Club. Mexican, Oriental, and French buffets are scheduled.

