



FIRING a burst from his M-16 rifle, the defender is about to wipe out one of the attackers on the Coyote Canyon hillside. But it's not as lethal as it appears. Laser equipped M-16's permit next-to-real-thing training exercises for nuclear material security forces. Complete story on page 5.

Safeguards

The M-16 & The Laser—Next To The Real Thing

From the beginning, the laser has excited the imaginations of Sunday supplement writers, and the public image of the device is a clutter of sinister (and largely erroneous) impressions—death rays and the like. In real life, the laser emerges as one of the good guys, with benevolent applications in medicine (surgery of the eye), civil engineering (surveying), fusion research, even in manufacturing (drilling microscopic holes).

Now the laser is being adapted by the Labs to bring to the training of nuclear security forces a verisimilitude that is uncanny in its closeness to the real thing. Jim Kaiser of Transportation Systems Division 1716 described for LAB NEWS how their group is using lasers.

"In the Safeguards program, after the safe-secure trailer (SST) was developed for transport of nuclear materials, more attention was placed on the human element—how to enhance the performance of the security force that would accompany the SST. If the SST convoy is attacked, by terrorists or whomever, how can we help assure that the escorts are prepared, physically and mentally, for such an attack?

"We think we have a pretty good answer to that with our laser equipped M-16's. M-16's are a principal weapon of DOE couriers and now, when we hang the laser on this rifle, here's what happens in an advanced training exercise:

- assuming an ambush scenario, the bad guys and the good guys can both aim and shoot at each other over ranges consistent with the actual range of the M-16;
- noise and confusion will be about the same as in a real attack because blank ammunition is used and, for that matter, the supply of ammunition will be a constraint just as it would be in real life;
- when you or your opponent shoot at someone with the laser beam, special detectors on the vest and helmet of each participant translate the beam into either a 'kill' or a 'near miss'

[Continued on Page 5]

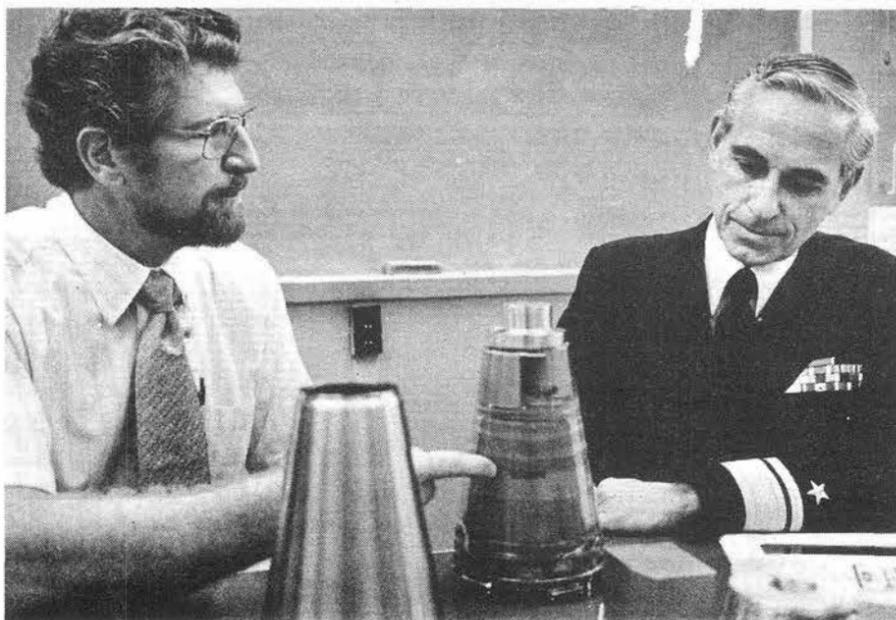
LAB NEWS

VOL. 30, NO. 16

AUGUST 4, 1978

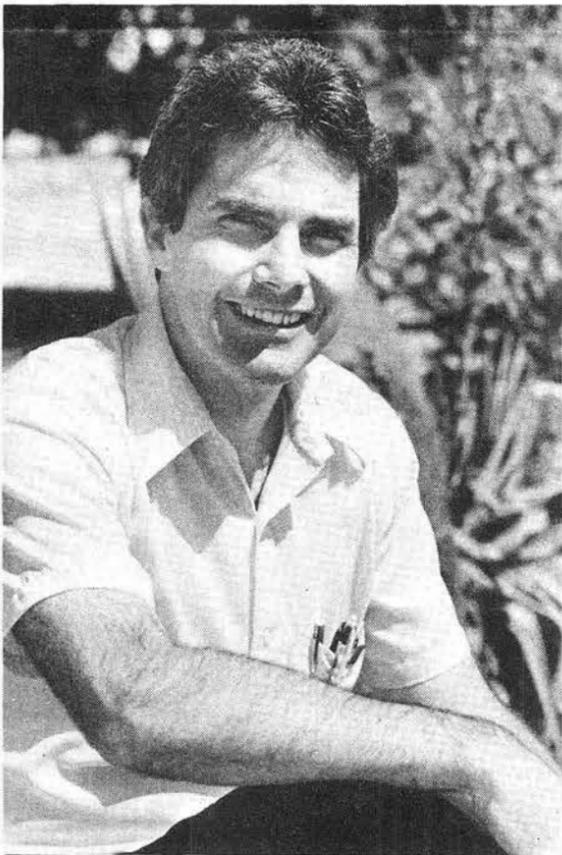
SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

A VISITOR last week was Rear Adm. Robert Wertheim director of the Navy's Strategic Systems Project Office in Washington, D.C., which is concerned with Polaris/Poseidon/Trident fleet ballistic missile systems. The admiral is shown with Gene Ives, manager of Systems Development Dept. 4330, as they examine Mk 4 AF&F system developed by Sandia.



CPR'ers Take Note

If you are one of the thousand Sandians who completed the Labs sponsored CPR training in the last few years, you'll probably receive a memo shortly scheduling you for a CPR recertification class. This will consist of a film, practice, and recertification. The classes run from Aug. 15 to Aug. 25, five times a day. Medical is running the recertification program, and Wanda Cupp, 4-7169, can be called for further information.



SCOT FISHBURN (2644)

Supervisory Appointment

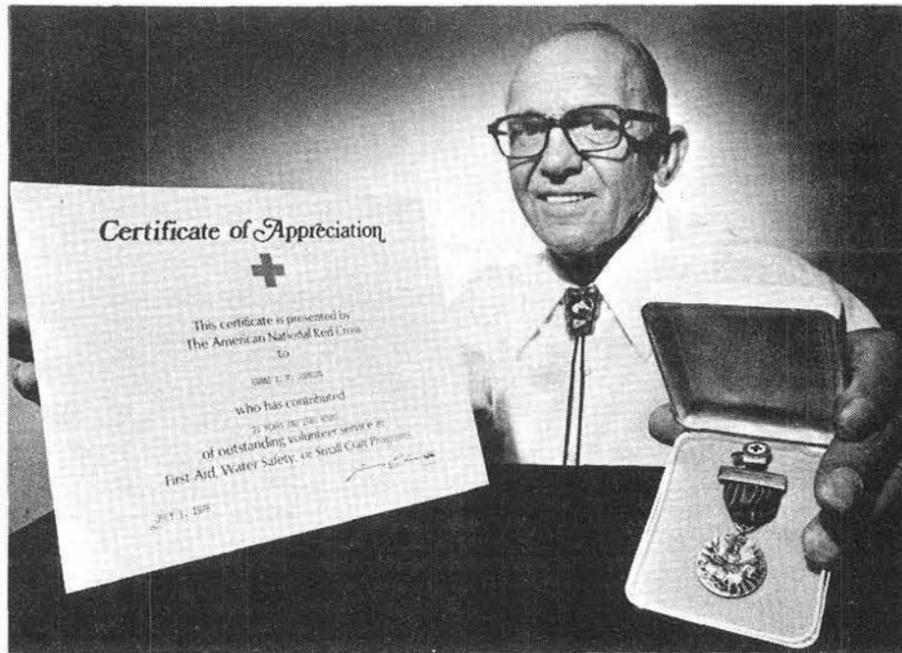
SCOT FISHBURN to supervisor of Computer Graphics Division 2644, effective Aug. 1.

During his entire nine years at the Labs, Scot has worked in the computer directorate. Much of his work has been concerned with the installation of computer-related systems throughout the Labs: remote job-entry terminals, the time sharing system, and the shared permanent files on the scientific computers. He also helped develop secure operating systems for computers in order to comply with ERDA and DOE regulations.

Before joining Sandia, Scot worked on the Sprint missile at White Sands for WE. He earned his BS in mathematics from Brigham Young University and, under Sandia's OYOC program, received his MS in computer science from Purdue. Scot is a member of the Association for Computing Machinery and, in off hours, is active in church affairs. He and his wife Sheila have four children and live in the NE Heights.



RETIRING is the Manager of GE's Neutron Devices Department, Leo Kiley (center). GEND, located in St. Petersburg, Florida, is responsible for procurement and production of neutron generators and other weapon hardware. Noting the close cooperation between the Labs and GEND, President Sparks presented this memorial plaque to Mr. Kiley, who plans to settle in Santa Fe. Also at the ceremony was Dan Suci, at right, who succeeds Mr. Kiley.

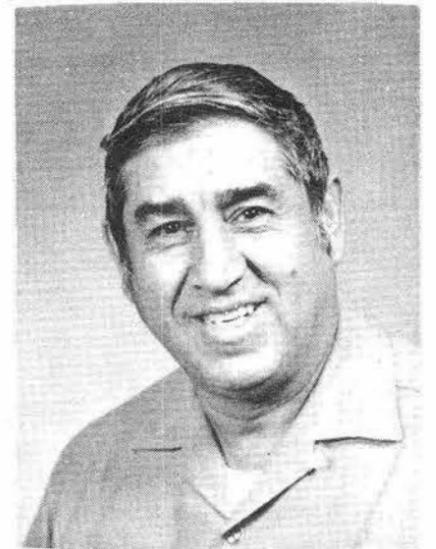


GRANT JOHNSON (3727) reckons he has taught "about a hundred" classes for the Red Cross in 1st aid over the last 21 years. The agency figures Grant deserves a medal for that sort of dedication and we agree. Many of Grant's former pupils have reported instances, large and small, where 1st aid training has helped save the day.

RETIRING



Marcella Hightower (3255)



Charles Garcia (3421)



Mabel Bracken (2553)



Gilbert Atencio (3421)



Ramon Lucero (3413)

LAB NEWS

Published every other Friday
SANDIA LABORATORIES
An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPAH, NEVADA
Editorial offices in Albuquerque, N.M.
Area 505 264-1053
FTS 475-1053
ZIP 87185
In Livermore Area 415 422-2447
FTS 532-2447

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

chuck cockelreas & norma taylor write
bill laskar does picture work
so does russell smith

bruce hawkinson & lorena schneider report livermore



Supervisory Appointment

ED BARSIS to manager of Digital Electronics Subsystems Department 2330 effective Aug. 1.

Ed joined the Labs in 1969 as a staff member in a Livermore weapon component division doing work in solid state and shock physics. In 1971 he was promoted to supervisor of a device studies division and, in 1977, became supervisor of divisions concerned with the advanced development of nuclear weapons.

Before Sandia, he spent two years with the Army. He holds bachelor's, master's, and doctoral degrees from Cornell, all in engineering physics. Ed and his wife JoAnn have three children. His hobbies, tennis and biking, should fit well into the New Mexico environment—he likes hills.

Authors

Ken Wilson (8347) and D. N. Seidman (Cornell University), "The Point-Defect Structure in State II of Ion or Electron-Irradiated Tungsten as Studied by Field-Ion Microscopy," RADIATION EFFECTS, Vol. 33, p. 149.

Jim Shelby (8347), "Molecular Dissolution and Solubility of Hydrogen Isotopes in Vitreous Silica," JOURNAL OF APPLIED PHYSICS, Vol. 48, p. 3387.

John Smugeresky (8312), Rand German and Clarence Karfs (8312), "Fracture Path in Hot Isostatically Pressed Superalloy A-286," POWDER METALLURGY INTERNATIONAL, Vol. 9, No. 4, pp. 178-79.

Jack Dini (8312), Rudy Johnson (8312) and Al West (8315), "On the High Temperature Ductility Properties of Electrodeposited Sulfamate Nickel," PLATING AND SURFACE FINISHING, Vol. 65, No. 36.

John Smugeresky (8312) and Rand German, "The Consolidation and Properties of a Hot Isostatically Pressed Iron-Based Superalloy," METALLURGICAL TRANSACTIONS, Vol. 9, p. 253.

BIKEPOOLERS—For the past three years, Ken Wilson (8347) and wife Sharon (LLL) have commuted to work via tandem bike—five miles each way. "It's fun," says Ken, "and doesn't take any longer than driving, then walking in from the parking lot—much more pleasant than fighting traffic jams." Ken also rides a single bike into the nearby hills at lunchtime, and on weekends he and Sharon enjoy tandem bike tours.



LIVERMORE NEWS

VOL. 30, NO. 16

LIVERMORE LABORATORIES

AUGUST 4, 1978

Princeton Funds Tritium-Related Studies

The world's first deuterium-tritium tokamak fusion device, Princeton's Tokamak Fusion Test Reactor (TFTR), should benefit from two diagnostic studies now underway at Sandia. Both studies are being conducted at the request of the nation's lead lab in the TFTR effort, Princeton's Plasma Physics Lab. Mike Malinowski in Physical Research Division 8347 is the principal investigator on both studies.

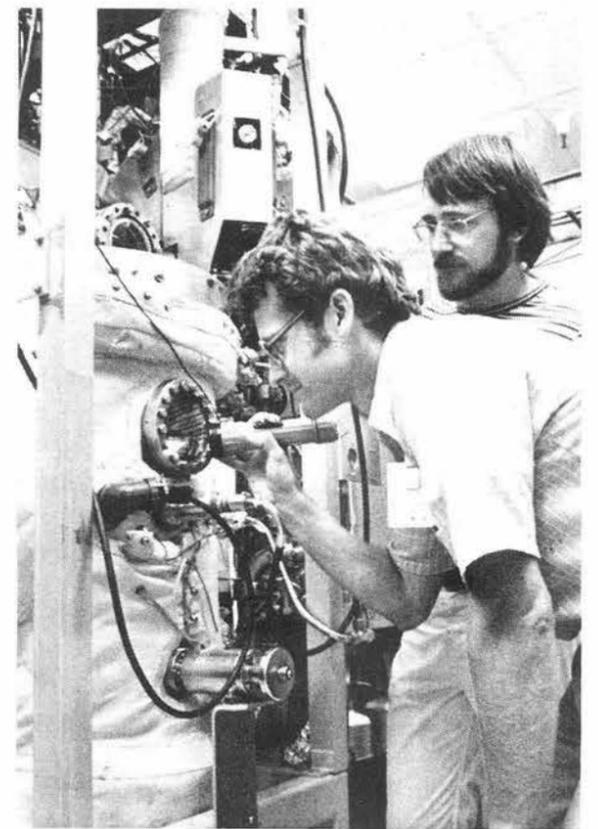
The first study examines the effect of tritium on electron multipliers. Electron multipliers are valuable as diagnostic tools in a tokamak's vacuum system. In operation, they amplify either ion or electron currents. The problem is that tritium may contaminate the electron multiplier and produce false readings on the instrument; since tritium decays with the emission of electrons, the free electrons become an extraneous source of electrical current and thus a creator of noise in the multipliers.

"Our first step," says Mike, "is to learn just how much noise is produced in the multipliers after a series of controlled tritium exposures. We'll cover a wide range—from 10^{-8} torr-seconds to 50 torr-seconds, the estimated maximum dose in tokamak applications."

The second study investigates desorption of deuterium from thin (1000 to 20,000 Angstrom) titanium-deuteride films in an attempt to predict the decomposition of titanium-tritide films. Such films are used as getters and are critical to the discharge performance of current tokamaks, so it's likely that they'll be valuable in the next generation, too.

The problem here is that titanium films readily absorb tritium. Eventually a sizable portion of the tokamak's tritium inventory could end up in the titanium.

Says Mike, "We'd like to determine the temperatures that will force the titanium



INVESTIGATOR MALINOWSKI, his technical assistant Steve Guthrie, and one of their primary tools—an ultrahigh vacuum evaporator that can react titanium films with deuterium *in situ* and analyze surface compositions of the films at any step in the process.

to release the tritium, and the time it takes the decomposition reaction to occur. To do this, we're currently substituting deuterium for the tritium—it behaves in similar fashion—and we're studying its desorption from titanium deuteride films. Preliminary data indicate that some temperature between 100° and 250° C could work. Obviously, the higher the temperature, the faster the desorption, but 250° is the upper limit for a tokamak device so we'd like to find a lower temperature that would still permit the reaction to occur in a reasonable time, say eight hours or so.

"Sandia is uniquely suited for such a study," Mike continues. "We can deposit thin hydride-forming metal films on stainless steel substrates in a ultrahigh vacuum, react them with deuterium *in situ*, and determine their surface compositions at any time. A series of such tests should permit us to specify to Princeton the desirable operating temperature range.

"Both studies are small but fascinating. They're a good match between Princeton's needs and Sandia's demonstrated capabilities."

Sympathy

To Val Cowan (8400) on the death of her husband in Livermore, June 27.

Abajo to Zuni—The Names Are Colorful



When you've grown up in Boston, where all place names are predictably and rigorously Anglo-Saxon (e.g., Lowell, Winchester, Marblehead, Medford, Amherst, and so on), it's something of a cultural shock to alight in New Mexico and to make acquaintance with the names of its cities, towns, and geographical features.

First, they are multi-lingual, including names of Indian, Spanish and English origin. And combinations thereof. But they are also imaginative, candid and, not infrequently, they reveal a pungent humor. Consider this sample: Ahogadera, Carrizozo, Dusty, Grumble Gulch, High Lonesome, Macho Creek, Pie Town, Midnight, Pronto, Weed, Zacatosa.

We spent a few enjoyable hours recently with a book that deserves a place in every car's glove compartment: *New Mexico Place Names, A Geographical Dictionary*. The author, T. M. Pearce, has proceeded through our state to come up with some 5000 items, each of which is more-or-less etymologically defined. Here, for example, is an excerpt on a well-known stop on Interstate 40:

"*Tucumcari*...A folk tale credited to Geronimo relates that an Apache Indian maiden named Kari had a sweetheart, Tocom, who was slain by Tonapon, a rival. After the death of Tocom, Kari is said to have killed Tonapon and then taken her own life. Whereupon, Wautonomah, her father, stabbed himself, crying, 'Tocom! Kari!' ...The most convincing explanation is contributed by Elliott Canonge, Oklahoma linguist, who writes that the name is Comanche *tukamukaru*, "to lie in wait for someone or something to approach."

Does this mean the Comanches were first in that long line of speed trap setter-uppers?

Many New Mexico place names are rather exuberant:

Belly Ache Mesa	Broke Off Mountain
Crazy Peak	Me Own Hills
Nester Draw	Quien Sabe Creek
Rough & Ready	Stinking Lake
Wahoo Peak	Wedding Cake Hill
X-Ray	Zorro

Others are unadorned:

Claunch	Ima
Jal	Lava
Lon	Quirk

We wondered about this one:

Lesbia (formerly Rudolph)

The names of Indian origin are linguistically intriguing:

Abiquiu	Cuyamungue
Guachepangue	Kinibito
Pojoaque	Taaiyalone Mt.
Tiz Nat Zin	Tesuque

Place names are not immutable. In the coal mining country around Raton, a small town called *Brilliant* used to be called *Swastika*, a word of Sanskrit origin that meant "good fortune." But in the 1930's, Swastikans decided that good fortune reposed in a less provocative label. *Brilliant* was their choice, though it, too, is likely to elicit comment not always in harmony with the high aims of the name-changers.

The Spaniards probably contributed more to the New Mexico lexicon than any other group. Their names, too, are generally descriptive, but many are familial:

Alamogordo (large cottonwood)	Gurule (Spanish family name)
Bosque (wood, forest, grove)	Belen (Spanish for Bethlehem)
El Vado (ford of a river)	Baca Location (family name)
Jicarilla (little basket cup)	Los Lunas (family name)
Los Alamos (poplars, cottonwoods)	Nogal (walnut tree)
Oso Creek (bear)	Quemado (burned)
Soledad Canyon (solitude)	Tijeras (scissors)

Everyone knows that Albuquerque is named after that Spanish duke, and it's true that we all have problems with out-of-state sales clerks trying to spell the name of our city, but just suppose that a wandering group of Navajos had happened by and settled this area first. They might have called it Cheechilgeetho ("oak by water") which happens to be the name of a trading post south of Gallup. So now we'd have the Cheechilgeetho Dukes, the Cheechilgeetho Journal, and Cheechilgeetho High—now there's a name with all the makings of a great school cheer. •js

Take Note

The American Nuclear Society has notified Dave Aldrich (5413) that he has won the 1977-78 Nuclear Reactor Safety Division award for the best student paper. Dave, a Sandia summer hire from MIT in 1977, completed research on reactor risk analysis while at Sandia, and this was the basis of his doctoral thesis. The thesis won the ANS award. Peter McGrath (formerly 5413) was Dave's thesis advisor. Subsequently, Dave was hired as a full time employee by Sandia. He is now on assignment in West Germany, doing reactor safety studies, and is scheduled to return to Albuquerque in October.

* * *

A "Handicapped Awareness Fair" is set for Aug. 17 at the Convention Center from 9 a.m. to 4 p.m. Sandians concerned with this subject are urged to attend. The Fair includes films and lectures, and a number of booths will provide information on insurance, tax breaks, the Rehabilitation Act of 1973, EO/Affirmative Action, accessibility, appliances, and in a number of other related areas. Hazlet Edmonds (3511), 4-9481, has additional information.

Events Calendar

- Through Aug. 27 — "Boeing-Boeing," Barn Dinner Theater, 281-3338.
 July 21-23—"Tea and Sympathy," Corrales Adobe Theatre, 8:30 p.m., 898-1943.
 Aug. 4-6—10th Annual Old Lincoln Days in Lincoln, NM.
 Aug. 6—A free lecture and slide presentation on 19th Century Navajo weaving by Marion Rodee, UNM Maxwell Museum of Anthropology, 3 p.m.
 Aug. 7—UNM Lecture Under the Stars, Sid Fleming and the Old Time Fiddlers, Central Mall, 8 p.m.

Sympathy

- To Gene Lucero (9571) on the death of his mother in Springer, NM, July 19.
 To Amadeo Carter (9572) on the death of his father-in-law in Albuquerque, July 19.
 To John Newton (9582) on the death of his mother in Albuquerque, July 12.

Authors

- R. M. Axline (2344) and A. K. Fung (Univ. of Kansas), "Numerical Computation of Scattering from a Perfectly Conducting Random Surface," Vol. AP-26, No. 3, IEEE Transactions of ANTENNAS AND PROPAGATION.
 P. B. Bailey (5121) and M. J. Norris (5120), "On the Interval of Existence for Nonlinear Two Point Boundary Value Problems," Vol. 9, No. 3, SIAM JOURNAL ON MATHEMATICAL ANALYSIS.
 W. T. Brown (5162) and P. J. Chen (5131), "On the Nature of the Electric Field and the Resulting Voltage in Axially Loaded Ferroelectric Ceramics," Vol. 49, No. 6, JOURNAL OF APPLIED PHYSICS.
 R. H. Kiehl and R. E. Hibray (both 5133), "High-Speed Digital Microwave Transmitter Utilizing Optical Modulation," Vol. 66, No. 6, Proceedings of the IEEE.
 F. K. Truby (5215), "Spontaneous Explosions in Multiatmosphere H₂-F₂-O₂ Mixtures," Vol. 49, No. 6, JOURNAL OF APPLIED PHYSICS.

The M-16 & The Laser

sound signal, so that the target of the laser pulse knows immediately whether he's dead or only in a very delicate situation; the 'near miss' is akin to hearing a bullet whiz by;

—you can seek shelter but, as in real life, a patch of tumbleweed or a small pinon won't do you any good—enough of the laser beam gets through to activate the detector. You have to hide behind a boulder or some other substantial barricade."

The laser device that does this was developed for the Army by the Electro-Optical Systems Branch of Xerox and is called "MILES," for Multiple Integrated Laser Engagement System. It could revolutionize combat training exercises in the Army which, up to now, have been characterized by umpires and a great amount of haggling as each side claims its kills. In the military context, besides the M-16 laser, there are MILES for tank and anti-tank weapons, machine guns, and for the whole roster of military armament. These MILES are designed so as to preclude kills of the more formidable by the less formidable—an M-16, for example, doesn't kill a tank.

Wayne Ebaugh, also 1716, has worked closely with Jim Kaiser and is enthusiastic about the laser equipped M-16's and their possibilities. "We're constructing a simulated stretch of highway out in Coyote Canyon where ALO will take DOE courier teams, put them in a convoy with a tractor/trailer rig and ambush them along the way. We'll cover the entire ambush with TV, and later on do a complete post mortem to show exactly what did transpire and who won. I don't see how you can get any more realistic." And, as project engineer Con Dickey notes, "This capability is just the beginning. Eventually, we hope to design and add additional instrumentation to automatically record each participant's contribution. This will allow more meaningful analysis of small force engagements and help identify needed improvements."

Bob Wilde, supervisor of the group, notes that this training approach is not restricted to couriers charged with the security of nuclear material under transport. DOE has many fixed sites (like Sandia) where the need exists for more realistic training of security forces. Sandia Security, which is planning to augment its armament with automatic weapons, plans to initiate its weapon training using the MILES equipped versions. Since live ammunition is not used, training proceeds with absolute safety.

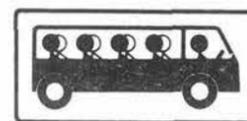
"Ultimately," says Bob, "the MILES M-16's and follow-on weapons should be the means for us to gain good data that we can use in our computer models. Once we have confidence in our models, we can then make meaningful statements about the overall effectiveness of a Safeguards system." •js



LASER unit, attached to muzzle of M-16, activates reflectors on harness or helmet when shooter is on target, causes distinctive sound signals—one for "Kill," one for "near miss." Blank ammunition is used to heighten sense of realism. This team from Org. 1716 is exploring potential of device for training purposes. From left, Jim Kaiser, Wayne Ebaugh, Con Dickey, Jim Heider; at rear, Mark Bishop and Clifton Schertz.



WHEN exercise starts, participants quickly get into spirit of the thing. Competitive aspect enhances training—no one wants their side to come up losers.



Bus Notes

A few issues back we listed schedules for the five city buses that enter the Sandia Tech Area. For people who live in the South Valley, Los Lunas, or Belen, the Sanchez Bus Co. operates two Sandia specials. Twenty-ride tickets may be purchased from the Credit Union or the bus driver; cost is \$16 except for those more distant localities which are asterisked on the schedule below. The 20-ride ticket for these stops is \$20. Individual rides may also be purchased upon boarding.

SOUTH VALLEY BUS SCHEDULE

Bosque/Los Lunas

	Lv. A.M.
Cerro Loop	6:55
Hiway 47 & the Bridge	7:00
Valencia Fire Station	7:05
Fina Station	7:08
Peralta Post Office	7:12
Bosque Bank	7:14
Isleta Road & Rt. 47	7:18
Arrive Gate #1	7:45

Return trip leaves Gate #1 at 4:35 p.m.

Belen

	Lv. A.M.
*Rio Communities	6:35
*River Road	6:38
*Pat's Barber Shop	6:41
*Piggly Wiggly	6:45
*Los Chavez Fire Station	6:53
*Baptist Church	6:55
La Fuente (Rosie's) Cafe	7:00
Husky Station	7:06
I-25 Ramp	7:15
Arrive Gate #1	7:45

Return trip leaves Gate #1 at 4:35 p.m.



The *Detroit Free Press* offered 120 families \$500 each to swear off TV for 30 days. Ninety-three families responded with a definite NO! Five of the other 27 finally agreed. What happened during those 30 TV-less days? One couple stopped talking; two couples had more sex; two people became chain smokers. Everyone reported extended periods of boredom, depression and nervousness. (Self-sufficiency is still alive in Detroit, but pretty feeble.)

5MW Solar Facility Control System Successful

The world's largest experimental solar facility is now undergoing operational testing. With 222 heliostats installed, a water calorimeter receiver in place, and a computerized master control system operating, the Solar Thermal Test Facility—the Power Tower—is carefully being brought “on line.”

The control system, designed by a team led by Dave Darsey of Digital Systems Development Division 1521, successfully integrates the myriad elements of the system—heliostat control, operation of the complex plumbing and pressure systems of the receiver/boiler, the data collection system, safety features, and weather data. Information on each element goes to the master operator's console where it is summarized, color coded and displayed graphically on a TV monitor. Programmed instructions and a keyboard provide the operator with instant control of the entire facility.

“A network of minicomputers gives us facility integration,” Dave Darsey says. “The network is flexible, too, so that we can collect data and do analyses for many experiments. It's also expandable.”

“Since the Power Tower will test prototype solar hardware for commercial applications, flexibility of the control system and acquisition of data were principal considerations,” Dave says. “Safety was overriding. We had to plan around the potential hazards of the focused beams and take into account the superheated steam in the receiver/boiler area. We built in checks and audible alarms, go and no-go controls and, of course, a backup manual control system.”

A principal safety feature is concerned with the “standby focus point” of the heliostats, located in space 10 metres east of the tower. The automated controls move the heliostats to this point prior to their being focused on the receiver/boiler. In front and behind this focus point, the beams are diffused and present no hazard to aircraft in the vicinity. The heliostats are then moved one at a time from the standby focus point to the receiver/boiler, thus preventing damage to the concrete tower. In an emergency, the heliostats are programmed to return to the standby focus point, and from there to move to a face-down position.

In addition to the master control console, there is an experimenter's console where the information displays may be duplicated. Test sequences may be automatically or manually controlled from these two interactive, color display consoles.

In normal operation, the sun's position is computed, and the control system signals position of proper focus for each heliostat. Mirror position is updated each second.

Receiver/boilers to be tested will be mounted atop the three-story elevator that moves from the basement to the top of the 200-foot tower. A minicomputer on the



DAVE DARSEY (1521) operates the master control system at the Solar Thermal Test Facility (Power Tower). Automated controls use a network of minicomputers to integrate operations and data acquisition.

elevator provides test data collection, does the initial analyses, and relays the data to the master control system where, in real time, it can be displayed or recorded for further analysis.

“We had to do our task as the facility was being designed and requirements being changed—all this in about 18 months. We believe we now have an

extremely successful system,” Dave says. “Most of our design features are being adapted for use by the first commercial-type solar power plant—the 10 MW facility being built near Barstow, Calif.”

Other Division 1521 people contributing to the control system design include Ray Hinds, Don Thalhammer, Terry Koontz, David Turner, and Malcolm Woodward.



ACCEPTANCE REVIEW — The solar thermal test facility recently underwent the first phase of its formal acceptance for operational use. Joe Weisiger (facing camera), Program Manager for Large Power Systems, from DOE's Division of Technology, took part in the acceptance review along with Bill Marshall, who is supervisor of the division responsible for the facility. Final phase of the acceptance procedure is set for September. The first receiver for the power tower is arriving from Boeing this week.

Career Enrichment Center: For The Unusual Student

Veronica, a senior at West Mesa High last year, knew that she didn't have enough credits to graduate. Only an average student, Veronica was discouraged with school, her attendance had fallen off, and she was ready to give up.

Then she went to a counseling session that described the Career Enrichment Center (CEC) and began to think that CEC might help. A talk with a CEC counselor prompted her to enroll in the first semester word processing class. Meanwhile, she dropped her courses at West Mesa. As the semester advanced, Veronica began to zero in on a secretarial career. During the second CEC semester, she resumed one class at West Mesa.

Veronica will graduate next year. She's enrolled in five classes at West Mesa and an evening class at CEC. And, thanks to the CEC courses, she can now realistically expect to find employment when she graduates.

* * *

Many experiences like Veronica's have occurred because of the Career Enrichment Center. More than 3000 students have taken courses at CEC since it opened three years ago.

Open to any high school student, CEC provides additional educational opportunities for two types of students: those who know which career field they want to pursue through college or technical schools, and those who don't know or who are not inclined to follow the customary academic route.

The first type benefits from individually structured, advanced study programs. The other group, in many cases, rediscovers a desire for learning, perhaps returning to high school if they have dropped out or changing their curricula toward a more career-oriented path; or, through CEC, obtaining some basic job skills to enable them to compete in the job market.

CEC classes meet on a year-round basis. Students may take a full schedule at their high school and an evening CEC course, or they may take a course at CEC as part of their regular school day. Buses transfer students to and from each school for each session. Credits earned at CEC are applied to high school records.

Younger children are also enrolled at the Center. Computer study programs for mid-school and elementary school students are offered, as well as programs for gifted children (one who is two or more years ahead of the normal grade level).

Whether gifted, or highly motivated, or just plain bored with the routine of high school, a student should consider the CEC alternative. Their courses—academic, vocational or avocational—go beyond that which individual high schools offer either because of the lack of specialized teaching and facilities or because demand is insufficient.

The electronics area is a case in point. In the first semester, work is devoted to electric appliance assembly and repair. Servicing of electric motors is another activity. Prerequisites for these courses are

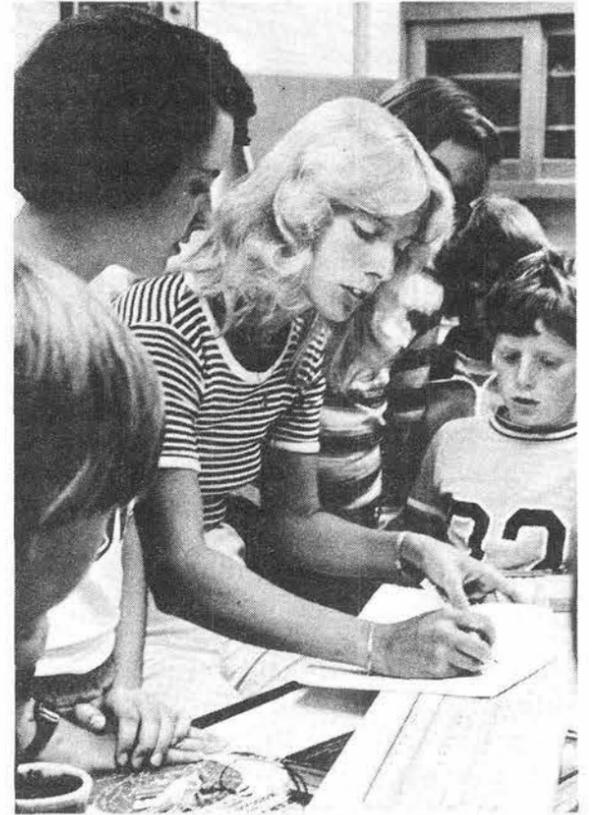
minimal yet, upon successful completion, the student has a basic job skill.

These courses are offered by CEC for 1978-79:

- Aerospace*
 - Aerospace Education
- Beauty Culture*
 - Beauty Culture
- Business Education*
 - Court Reporting
 - Word Processing I & II
- Computer Technology*
 - Computer Tech Aide
 - Data Processing & Data Entry
 - Computer Scientific Programming
 - Advanced Math/FORTRAN
 - Individual Computer Problems
- Electronics*
 - Electric Assembly & Repair
 - Servicing Electrical Motors
 - Digital Electronics
 - Solid State Electronics I & II
 - Communication Electronics I & II
 - Minicomputers
- Special Programs*
 - Drafting
 - Military Careers
 - Introduction to Engineering
 - Building Trades
- Science*
 - Human Animal I & II
 - Nurse Aide/Home Health
 - Field Botany/Plant Anatomy
 - Microbiology
 - Basic Physics
 - Physics Advanced Topics
 - Genetics & Cytogenetics
 - Epidemiology
 - Vertebrate Embryology
 - Investigations in Animal Behavior
- World Languages*
 - Practical French for Careers
 - Japanese
 - Beginning Italian
 - Advanced German
 - Communication in Spanish for Health Careers
 - Russian
 - Advanced Spanish
 - Lively Latin
 - Portuguese

Some of these courses earn university credits. Adults may audit any class on a space available basis. Private school students are also eligible for CEC enrollment.

Other activities at the Center include the Guidance Information System, available to any city high school student. GIS, a retrieval information system, helps youngsters decide on a college. For example, say that your child is considering forest management and wants to attend a school



SCIENCE TEACHER Lea Beth Welliver has the attention of these mid-school students enrolled in her astronomy class at CEC.

near home. GIS will provide a computer print-out listing all schools in the Southwest offering a degree program in forestry. Data on school size, campus housing, registration fees, tuition, student government and social activities, job potential and availability, and salary information will be included on the print-out.

The Center welcomes visits by parents and students. Counselors are available on Thursday evenings by appointment. An open house is set for October. The Career Enrichment Center, located at 807 Mountain Road (just south of Albuquerque High School), is open Mondays through Thursdays.

* * *

Two Sandian's serve on the advisory board of CEC. Hank Willis (3520) was head of the Board of Education that initiated the Center and brought it to completion. Gil Cano (5422) brings to the board both national and local experience in career education. •nt



HANK WILLIS (3520) and GIL CANO (5422) serve on the advisory board of the Career Enrichment Center.

Retiree Works As VAH Volunteer

Victor Gabaldon retired from the Labs in April 1974 after working here 23 years. Following retirement, he underwent open heart surgery at the Veteran's Administration Hospital in Albuquerque. During the long and tedious rehabilitation period, Victor's doctor suggested that volunteer work at the hospital might prove to be an additional therapy.

"He was absolutely right," Victor says. "I've been a VA Hospital volunteer for more than a year now, and it's rewarding and inspirational work. Even on the days when I'm not scheduled to work, if I'm feeling depressed I head right for the hospital. Talking and working with these patients is good for them, but it's also good for me."

Many organizations provide volunteers for the hospital—Red Cross, American Legion, Disabled American Veterans, numerous auxiliaries—and their activities are coordinated by the VA's Volunteer Service (VAVS). Victor, a member of DAV, has served as that group's hospital chairman for the past year.

Currently, he spends two days a week visiting every patient in the hospital. The visit may be no more than a short chat, or a long session involving compensations and claims. He works closely with patients about to be discharged. "Discharge for some who have been hospitalized for months or even years can be a real shock," Victor says. "We try to prepare them and their families for this change."

Victor also works with families of new patients. "This hospital serves four states," he says. "Many people from out of town need help in finding accommodations and



SANDIA RETIREES Victor Gabaldon (left) and Joe Seiler escort VA Hospital patient James Marchionda (former Sandian). Victor and Joe have been volunteers at the hospital for a year.

many just need someone to talk to."

VAVS needs more volunteers. After an orientation course, the volunteer decides on the number of hours to be spent at the hospital. Areas for volunteer service include pharmacy assistant, escort service, clerical work, manning information desks and library and recreation work. "We can also use night time or weekend volunteers," Victor says. "Right now we have a need for people to escort patients to the chapel for Sunday services."

Victor also sits with the problem solving committee. "That's just what it is," he says. "It's like being a union steward." He works

with patients, the professional staff and administrative people, and janitorial and maintenance people to solve difficulties.

Another activity of the VAVS is the Avenue of Flags. "The long, grass-bordered approach to the VA Hospital will be lined with flag poles. The U.S. flags, donated by relatives of deceased veterans, will be flown on all flag holidays," Victor says. "A plaque listing the deceased and his branch of service, and the flag donors, will provide a permanent memorial."

Persons interested in becoming a VA volunteer or who would like to donate a flag in the name of a deceased veteran, can call Victor at 255-8274.

Nutritionist Now Works With Medical Organization

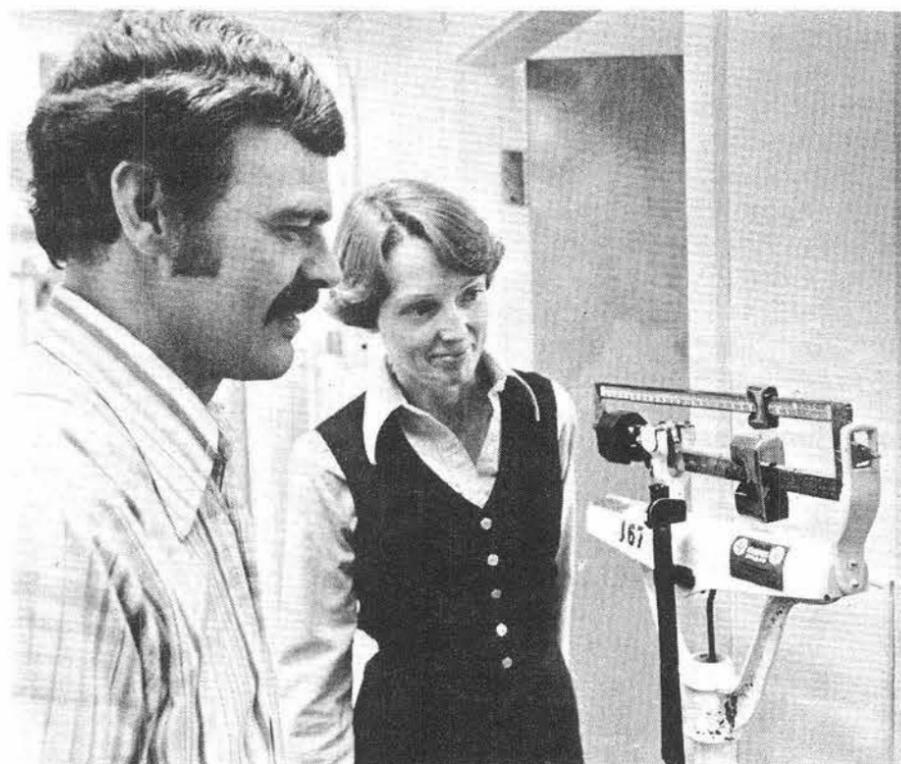
Let's say that you've begun to avoid full-length mirrors, and you know it isn't baby fat because you've got a few gray hairs, and you're tired of too tight clothing, so what do you do?

For starters, you might go to Medical, where one of the physicians may just refer you to Susan Brammer, a consultant working as a nutritionist for Medical on a part-time basis. Susan has been on the job at the Labs since last summer and has given advice to some 120 Sandians with weight or diet related problems.

"We start by reviewing their nutritional habits to pinpoint the problem areas," she says. "We go over caloric values and may even get into some behavioral modification. For example, I may suggest to the inveterate snacker that he or she make it a rule to confine eating to the dining room—just don't eat anywhere else."

But Susan's interests go beyond the weighty problems. "I'd like also to look at the nutritional component for the many employees who pursue physical fitness. Perhaps their fitness could be enhanced with some diet modifications."

Susan has a BS in home economics education from Oklahoma State, a second BS in dietetics from UNM, and she is a



A REAL LOSER — Don Keener (9652) is one of nutritionist Susan Brammer's star pupils, having dropped 40 pounds since last February. Susan works as nutritional consultant with Sandia Medical.

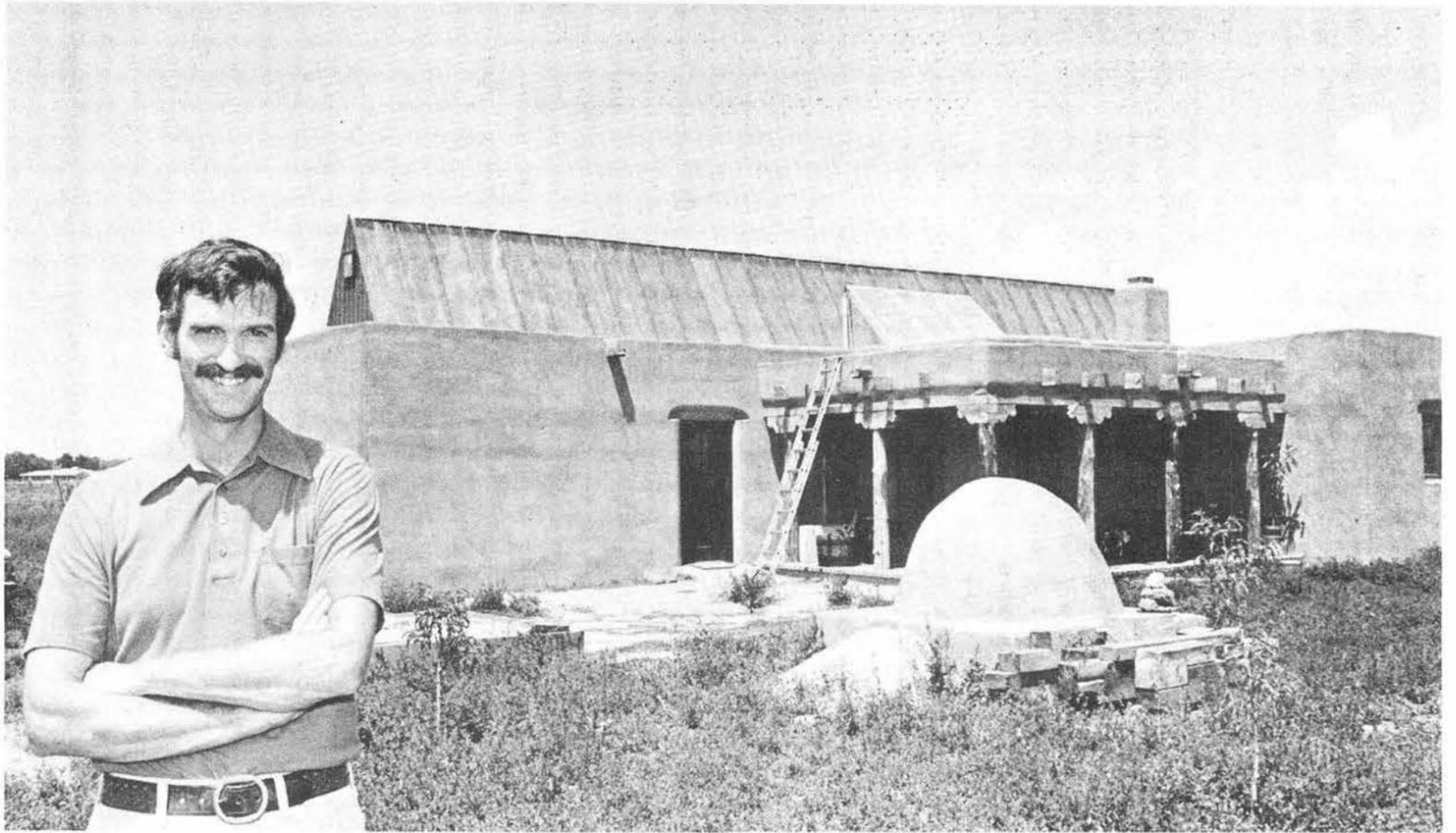
Registered Dietician. She is currently studying at UNM for her masters in health education. She has been a teacher in her field and has worked as a home economist for several firms, including the Public Service Co. and Pillsbury. Husband John is an engineer in

Systems Engineering Division 1136.

For the future, Susan plans to write an occasional article on nutrition for LAB NEWS readers. In the meantime, she welcomes specific nutritional questions and can be reached through Medical's receptionist on 4-7845.

Mike Edenburn Builds Solar Adobe Home

MIKE EDENBURN (5716) at his new adobe home in Peralta. Note large solar collector structure on roof for space heating and smaller collectors for hot water heating.



[Ed. Note—This is third in a series about home solar systems of Sandians. If you have an operating system, call the LAB NEWS, 4-1053.]

Mike Edenburn's (5716) new home in Peralta is a classic adobe that sits low on a two-acre field of alfalfa. The thing that makes it different is the triangular solar collector on the roof. Mike's 2400 sq. ft. home has a solar space heating system as well as a solar hot water system.

"No gas in the house at all," Mike says. "There's an auxiliary electric furnace for heating and a small electric unit for hot water. Last winter was mild, and we didn't use the auxiliary furnace at all. The solar hot water system provided 95 percent of our needs in summer, maybe 60 to 70 percent in winter."

The south-facing side of the large (8'x60') collector on the roof has two layers of transparent greenhouse fiberglass separated by 4" of air space. Inside is corrugated roofing steel painted flat black. Behind this surface is 6" of insulation and another sheet of metal roofing. Air heated within this collector is taken by blower down inside the house through a bed of gravel—the thermal storage unit. It contains 20 tons of gravel in a 3'x8'x16' wire mesh cage, with two feet of air space on each side.

Warm air is pulled from the thermal storage unit by a blower and distributed throughout the house by under-the-floor ducts as in any forced air heating system. A thermostat controls the air flow.

The hot water heating system uses three additional collectors lined with flat-black-painted copper sheeting. Cold water entering from one side circulates through a copper tubing grid inside the collector chambers. The high-temperature water goes to a heat exchange coil where it heats up water for use inside a 65-gal. tank. The closed system contains a propylene glycol water solution to prevent freezing in winter. A small electric pump provides circulation of the hot water through the collectors and tank.

"If we need more hot water," Mike says,

"we turn on the auxiliary heating unit."

Mike and his wife Laurel planned and designed the house, managed the subcontracting, and did most of the carpentry and finish work. They also installed the massive wood beams of the ceiling and roof.

One-inch urethane foam sheeting clads the outside of the thick adobe walls. The roof has 12" of insulation. All windows are double paned.

"The house temperature changes less than 4° from day to night," Mike says. "We don't need an air conditioner."

The family room has a huge fireplace with an air circulator which Mike calls his defense in depth for a really cold winter with prolonged periods of cloudiness. Last winter he burned about a cord of wood to take the edge off the chill.

At Sandia, Mike has worked in solar energy projects for five years. A member of

the first group that worked on the total solar energy concept, he now works in photovoltaics.

Mike calculates that his solar system puts from 50 to 60 percent of the available solar energy from the collector structure into the house. The economics of the system are difficult to compute since he has no "before" figures, and his instrumentation is limited.

"I saved the cost of having gas piped into the house and the cost of a gas furnace," he says. "I figure the cost of the solar system at \$4500 which, of course, is part of the mortgage. As part of its solar incentive program, the State of New Mexico refunded \$1000 on the systems. In a couple of years I should have enough data to compute operating costs. In the meantime, we enjoy the house. It's very comfortable winter and summer." •dg



IF YOU'RE THINKING about Sandia's apprentice programs, as Mary Chavez and Gary Gallegos (both 3422) appear to be doing, then now is the time to consider enrollment in a relevant course—either one offered in Sandia's out-of-hours program or a course at T-VI. Enrollment period for both runs through Aug. 11. Out-of-hours catalogs are in yellow containers at the gates, and T-VI catalogs can be obtained from Ruth Brooks (3521) in Bldg. 632.

Fun & Games

Running—Tuesday next, the 8th, the Roadrunners meet at Grisham Park (Alta Monte & Shephard NE) and, on the 15th, at Bataan Park (Tulane & Lomas NE), both places at 6:30 p.m. The schedule includes running events for men, women, boys and girls, slows, intermediates and fasts.

We have entry forms for the La Luz Trail Race which will be run Aug. 20. Call LAB NEWS on 4-1053 if you want one.

* * *

Biking—If the air is hot and polluted, should you ride your bike to work? The Tech Library's John Gardner sends us a clipping from *Science* which says "go": "A young, healthy man bicycles to his office in the city. It is hot and muggy outside and the pollution index rises steadily as the day wears on. At the end of the day, the man hesitates to ride home. Should he leave his bike at work and accept a ride home with his friend who drives an air-conditioned car?....According to a recent DOT study, there may be no major adverse short-term effects on health as a result of bicycling in these conditions. So if the young man feels up to facing the hazards of traffic, he may as well bicycle home." The researchers point out that their conclusions apply only to young healthy male non-smokers.

* * *



LOW GROSS WINNER of SEGA's recent Fred Given Memorial Tournament is Leon Chapman (5741) who shot a 74 to sweep the field of 79 players. Ken Flynn (4335) was low net champ with a net of 70. The tourney was played July 22 on the UNM South Golf Course. Co-chairmen were Leo White (2337) and Don Hosterman (5342).

Congratulations

To Dee Chavez (3255) and Boney Vigil (2632) upon their marriage, July 6.

To Mr. and Mrs. Bruce Engler (5811), a son, Daniel Eric, July 24.

Fit Is Better

The Simplest Alternative—Walking

Last fall Frank Kohut (9633) was informed by his doctor that he had a slight medical problem and that he should, among other things, become more physically active—get more exercise.

For most people, such a prescription would today lead to a running/jogging regimen, and Frank would now be one in the legions of those huffing and puffing around the neighborhood or the Base gym. Except for one thing. "I don't like running," he says, quite firmly. "But I do like walking."

Casting about for a way to get the desired exercise, Frank put one-and-one together and arrived at the answer: he would walk to work. Last October he started, cold turkey, and he's been walking in since. The medical problem is under control, he feels better, sleeps better, enjoys walking more than ever. In fact, he even walks home from time to time (he buses otherwise) which, considering the six-mile distance, makes for a lot of walking in one day. "I'd walk both ways more often," he says, "except it just takes too much time."

What's involved in walking six miles to work? An early departure—Frank leaves at 6:15 a.m. from his home near Comanche and Pennsylvania NE. He walks briskly, arms swinging, and averages about 17 minutes per mile. At first he wore ordinary shoes, but they weren't equal to the pace and he shifted to hiking boots, leaving a pair of dress shoes in the office. He walks on the street facing traffic ("too many ups and downs on the sidewalks") and, in the darkness of a winter morning, is especially careful. There haven't been any significant problems with traffic.

* * *

We'd say that Frank Kohut has found a successful means to become physically fit. His regimen exhibits that paramount ingredient—enjoyment—whose absence so quickly brings about the termination of a physical fitness routine, however determined the participant may be at the outset. And walking, provided it's reasonably brisk, does produce cardiovascular benefit. Dr. Cooper in *The New Aerobics* assigns one point per mile of walking at a 15 to 20 minute per mile pace. You need 30 points per week, says Dr. Cooper, to achieve the "good" category of fitness, and Frank Kohut, at 6 miles/day, 5 times a week, has got his thirty.

Ralph La Forge, exercise physiologist at Lovelace-Bataan, prescribes walking for a number of his coronary patients who, for one reason or another, cannot tolerate running. It's a special kind of walk, though, that he calls "modified Olympic walking," characterized by extreme arm swing and a fast gait. In fact, Ralph notes, some of his walkers go faster than some of his runners. That which commends walking (vs running) for many people is the absence of pounding—it's orthopedically less stressful. One foot is always in contact with the ground.

On the minus side, you'll have to walk



FRANK KOHUT & JIM KAISER demonstrate far-out mode of commuting: walking. Frank (9633) and Jim (1716) usually join forces to cover the six-mile distance from their homes. Both have high praise for physical benefits of walking regimen.

for a longer period of time to gain fitness than if you were running. It's much less energy intensive. Make your own comparison by noting your pulse rate after walking and after running. Mine is at 160 following a run; I can't get it higher than 100 during fast walking.

For Sandians intrigued by the possibilities of walking but who don't feel up to the total distance from their home to work, consider a drive-and-walk routine. Drive (or bus) to within a comfortable distance, park the car in a shopping center and take off. Even if you do only a mile or so per day, that's infinitely better than non-stop inactivity. And the mile may later extend to two or three.

Finally, if you get really turned on to walking, Albuquerque has its own world class walker-hero, Jesse Castaneda, for you to take a shot at. If memory serves, I think that Jesse once ambled non-stop for a world record distance between two and three hundred miles.

* * *

Routes—Like bikers, walkers should avoid arterials and stick to residential streets. At the Wyoming Gate, a walker may continue on Wyoming or take one of the quieter bike routes that branch off to east or west just inside the gate. At the Gibson Gate, a walker can avoid that street's heavy traffic by taking a half-right just inside the gate and following the dirt path that cuts across the school ground. I've had no experience with the Eubank Gate but am informed by running friends who use Eubank that the route and gate pose no particular difficulty. For noon-hour walkers, consider the parade ground—a circuit is .65 mile. •js

Speakers

S. G. Varnado (5735), "Continuous Chain Drill Development," and "A Simulator for Sensitivity Analyses of Geothermal Well Costs," Geothermal Drilling and Completion Program Contractor Review Meeting, June 20-22, Washington, D.C.

R. D. Krieg (1281), J. C. Swearingen (5835) and R. W. Rhode (5832), "A Physically-Based Internal Variable Model for Rate-Dependent Inelasticity"; C. M. Stone (5431) and D. K. Gartling (1261), "Leakage Effects on LMFBR Cell Liners," ASME 1978 Pressure Vessels and Piping Conference, June 25-29, Montreal, Quebec, Canada.

H. J. Stein (5112) and V. A. Wells (2141), "Chemical-Vapor-Deposited Silicon Nitride: Effects of the NH_3/SiH_4 Ratio on MNOS Memory"; R. A. Kiehl (5133), "Avalanching Optoelectronic Microwave Gate," Device Research Conference, June 26-28, Santa Barbara, Calif.

D. W. Braudaway (2552), "A Flexible System with Two Selectable Ratios for Use with Josephson Voltage Devices," Conference on Precision Electromagnetic Measurements, June 26-29, Ottawa, Canada.

J. W. Nunziato (5131), "Steady Shock Waves in Granular Materials"; H. J. Sutherland (5167), "Acoustical Determination of the Shear Relaxation Functions for PMMA and Epon 828-Z"; D. Drumheller (5167), "A Variational Theory of Immiscible Mixtures"; M. J. Forrestal (5233), "Dynamic Expansion of 1018 Steel Cylinders"; J. Lipkin (5163), J. D. Campbell (Univ. of Oxford, England), and J. C. Swearingen (5835), "The Effects of Shear Strain-Rate Variations on the Flow Stress of OFHC Copper"; P. W. Conrad (5411), "Network Model for Free Convection with Porous Media"; W. T. Brown (5162) and P. J. Chen (5131), "Numerical Studies of the Electrical Response of a Ferroelectric Ceramic Subjected to Uniaxial Shock Loading," 8th U.S. National Congress of Applied Mechanics, June 26-30, Los Angeles.

I. J. Hall, R. R. Prairie, H. E. Anderson (all 1223), and E. C. Boes (5719), "Generation of a Typical Meteorological Year"; J. K. Linn and H. M. Dodd (both 5716), "A Cost/Performance Comparison of Line and Point Focus Collectors in Process Heat Applications," Systems Simulation Analysis for Solar Heating and Cooling Conference, June 27-29, San Diego.

P. S. Peercy, H. J. Stein, B. L. Doyle (all 5112), and S. T. Picraux (5111), "Hydrogen Bonding and Concentration Profiles in Silicon Nitride"; C. E. Barnes (5133), "Gamma-Induced Trapping Levels in Si With and Without Gold Doping"; E. P. EerNisse (5133), "Role of Stresses in Annealing of Ion Implantation Damage in Si," Electronic Materials Conference, June 28-30, Santa Barbara, Calif.

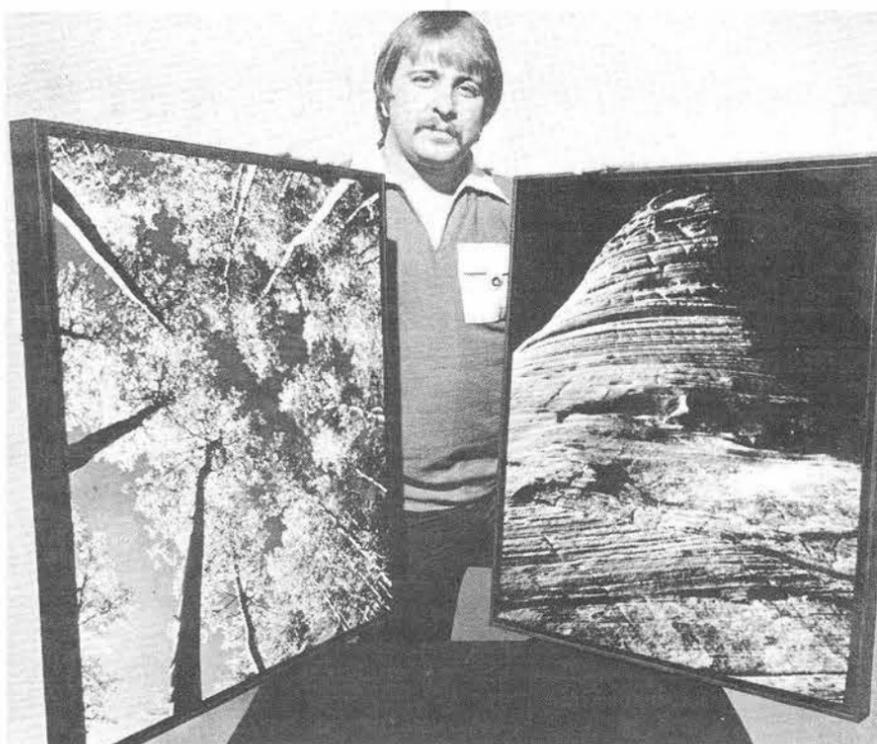
D. E. Arvizu (5713), "Central Receiver Heliostat Development"; J. A. Leonard (5721), "Linear Concentrating Solar Collectors—Current Technology & Applications," International Symposium on Concentrating Solar Collector Technology, June 14-15, Denver.

C. J. Northrup (5824), "An Overview of Technical Problems and Solutions in Designing Hydride Storage Beds," Symposium and Workshop on Design of Hydride Storage, June 20-21, Upton, N.Y.

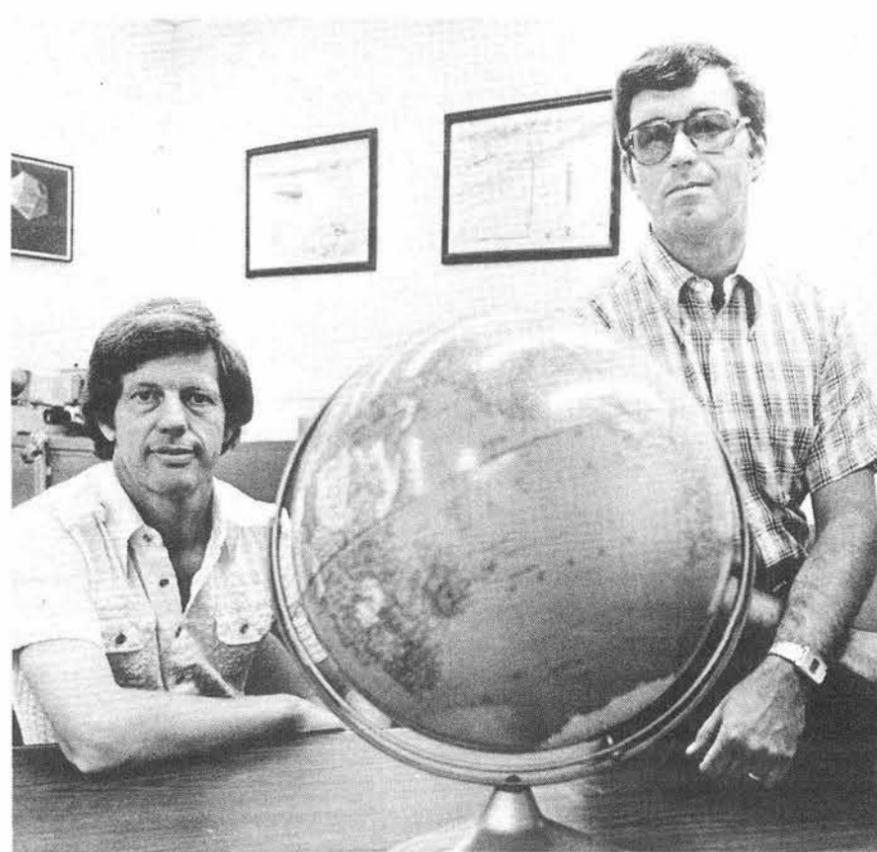
A. J. Chabai (5166), "Early Time Energy Coupling Associated with Cratering From Near-Surface Burst Nuclear Explosions," JASON Meeting, June 19, La Jolla, Calif.

K. W. Mitchell (5133), "Graphical Evaluation of Solar Cell Parameters"; J. K. Linn (5743), "Optimization of Terrestrial Photovoltaic Systems"; C. H. Seager (5155), "Electrical Transport in Neutron Transmutation Doped Polycrystalline Silicon"; J. L. Watkins and E. L. Burgess (both 5719), "The Effect of Solar Cell Parameter Variation on Array Output"; J. L. Watkins and D. A. Pritchard (both 5719), "Real-Time Environmental and Performance Testing of Concentrating Photovoltaic Arrays"; E. L. Burgess (5719), "Status of the Photovoltaic Concentrator Applications Experiments"; M. W. Edburn, D. G. Schueler and E. C. Boes (all 5719), "Status of the DOE Photovoltaic Concentrator Technology Development Project"; E. L. Burgess and D. A. Pritchard (both 5719), "Performance of a One-Kilowatt Concentrator Photovoltaic Array Utilizing Active Cooling"; K. W. Mitchell (5133), "High Temperature Operation of Two-Junction Photovoltaic Converters"; C. H. Seager (5132), "Zero-Bias Resistance of Grain Boundaries in Neutron Transmutation Doped Polycrystalline Silicon"; J. G. Fossum, R. D. Nasby (both 2146), and E. L. Burgess (5719), "Development of High-Efficiency $p^+ - n - n^+$ Back-Surface-Field Silicon Solar Cells"; D. R. Smith (5719), "Combined Photovoltaic Thermal collector Testing," 13th IEEE Photovoltaic Specialists Conference, June 5-8, Washington, D.C.

S. M. Myers (5111), "Thermal Processes and Equilibrium Phases in Implanted Alloys," and "Annealing Behavior and Selected Applications of Ion-



ONE MAN SHOW — Tom Zmiejko, a design draftsman in Org. 9658, is also an accomplished photographer, and an exhibition of his color prints runs through August in the Statesman's Club in the Albuquerque Federal Building on Uptown Blvd. NE. Visitors are invited. Tom has been active in photography for six years; he does his own darkroom work, including color printing.



TECHNICAL ADVISORS — Paul Stokes (1355) and Roger Hagengruber (1351) are serving as technical advisors on nuclear weapons to several State Department groups involved in arms control negotiations. Roger is a member of the U.S. delegation to the Conference of the Committee on Disarmament (CCD) meeting in Geneva, Switzerland. This is the multi-national body which negotiated the Limited Test Ban and the Non-Proliferation Treaties. Last year Roger served as technical advisor on radiological warfare in talks between the U.S. and Soviet Union. Paul served as a member of the CCD in 1974-75. Currently he is a member of the U.S. delegation in the Trilateral Comprehensive Test Ban negotiations between the U.S., Britain and U.S.S.R.

Implanted Alloys," AVS Symposium on Ion Implantation—New Prospects for Materials Modification, June 14, Yorktown Heights, NY.

B. T. Preas and C. W. Gwyn (both 2113), "Methods for Hierarchical Automatic Layout of Custom LSI Circuit Masks," received outstanding paper award; G. R. Case (BTL) and J. D. Stauffer (2113), "SALOGS-IV A Program to Perform Logic Simulation and Fault Analysis," 15th Design Automation Conference, June 19-21, Las Vegas, Nev.

J. T. Holmes (5713), "The 5MW Solar Thermal Test Facility," Argonne National Staff Seminar, June 21; and "The Solar Central Receiver Program," ASME Idaho Section 15th Annual Symposium, June 22, Idaho Falls.

G. B. Varnado and N. R. Ortiz (both 5412), "Fault Tree Analysis for Vital Area Identification"; J. W. Campbell (1754), "Electronic Self-Monitoring Seal"; J. F. Ney (1754), "Containment and Surveillance Systems for International Safeguards"; D. A. Reynolds (1757), "Design Features of an Automated Entry Control System"; W. D. Williams, F. J. Conrad, T. A. Burrows and L. L. Sandlin (all 1757), "Progress in the Development of Explosives Materials Detectors"; M. R. Madsen (1711), "The Role of Barriers in a Physical Protection System"; L. D. Chapman, D. Engi, L. M. Grady, H. A. Bennett and D. W. Sasser (all 5724), "Safeguards Automated Facility Evaluation (SAFE) Methodology," Nuclear Materials Management Conference, June 27-29, Cincinnati.

R. L. Fox (5731) and R. R. Eaton (1261), "Particle Tracing Techniques for Flows in Porous Media"; D. E. Berg (1334), "Surface Roughness Effects on a Mach 6 Turbulent Boundary Layer"; C. W. Peterson (1332), "Measurements of Flow-Field Properties in a Gasdynamic Laser Nozzle Wake"; K. J. Touryan (1260), B. M. Marder (2613) and G. R. Hadley (1261), "Near Electrode

Phenomena in MHD Channel Flows" F. G. Blottner (1261), "Flow Predictions for MHD Channels with an Approximation for Three-Dimensional Effects"; R. E. Sheldahl (1333), L. V. Feltz (1324) and P. C. Klimas (1332), "Free-Air Performance Tests of a 5-Metre-Diameter Darrieus Turbine with Extruded Aluminum NACA-0015 Blades," AIAA 11th Fluid and Plasma Dynamics Conference, July 10-12, Seattle.

J. A. Van Den Avyle (5835), W. B. Gauster (5111), W. B. Jones (5835) and W. R. Wampler (5111), "Examination of Fatigue Deformed 316 Stainless Steel by Positron Annihilation," Fatigue in Materials and Structures, Ecole Polytechnique de Montreal, July 10-19, Sherbrooke, Quebec, Canada.

L. R. Dawson (5154), "CVD Growth of Polycrystalline Silicon Thin Films for Photovoltaic Applications," American Conference on Crystal Growth, July 16-20, NBS, Gaithersburg, Md.

M. A. Gusinow (5215), J. P. Anthes, M. A. Palmer (both 5214), G. N. Hays, E. L. Patterson (both 5212), M. K. Matzen (5211), and K. M. Glibert (1112), "Radiation From Laser Produced Plasmas"; M. J. Forrestal (5233), "Simulation of Tamped Impulse with an Electrically Exploded Etched Copper Mesh"; S. Shope (5246), "PROTO-I As a Short Pulse X-Ray Source"; E. J. T. Burns (5242), "Soft X-Ray, Vacuum Ultraviolet Diagnostics of High Density, High Temperature Plasmas"; L. W. Kruse and P. E. Bolduc (both 5232), "Ion-Diode Neutron Production"; M. Sandoval (1351), P. E. Bolduc (5232), C. N. Vittitoe, T. P. Wright (both 5231), R. B. Miller (5246) and W. Motil (EG&G), "Extraction of a Low u/y Beam Over Many Meters—Near Field EMP Simulation"; W. Beeghold (5232), "Sandia Simulation Development," Joint JOWOG 6/Sub-WOG-268 Meeting, June 27-29, Albuquerque.

G. C. McDonald (9636), "The Solar Assist Greenhouse," Los Altos Kiwanis Club, June 1, Albuquerque.

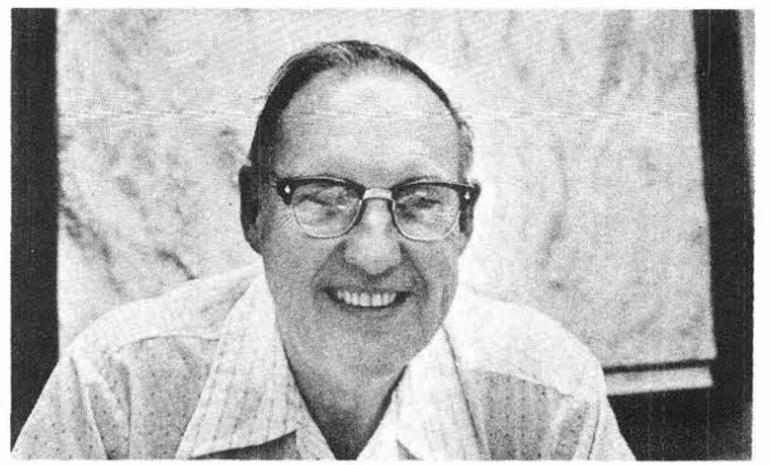
MILEPOSTS

LAB NEWS

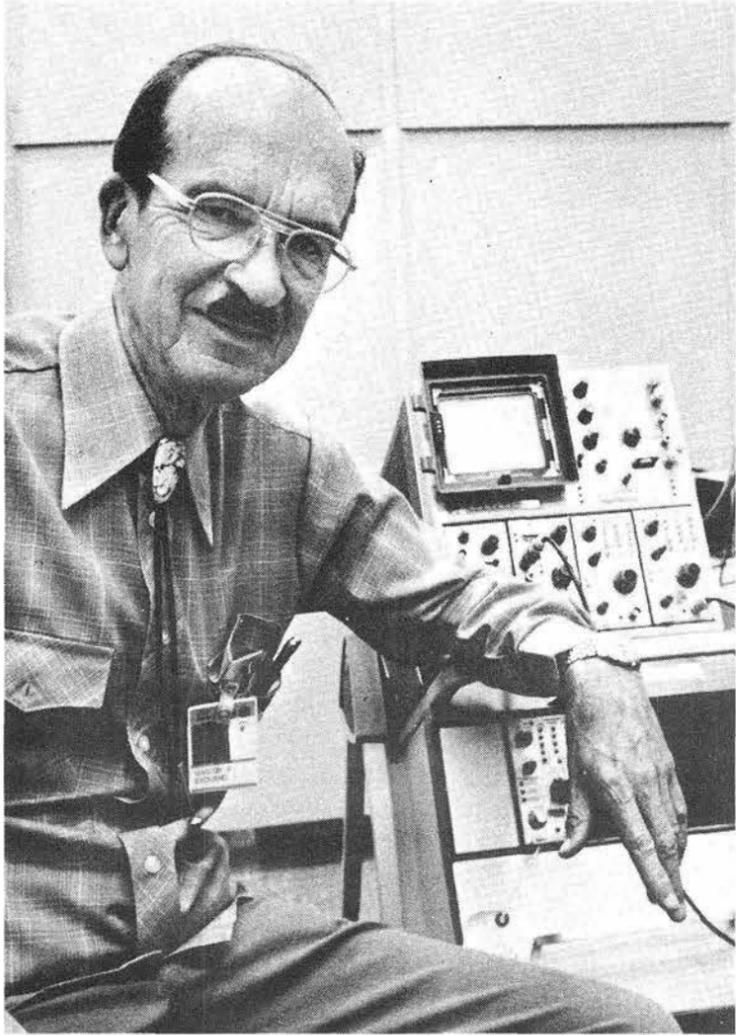
AUGUST 1978



John Smith - 9658 20



Tom Marker - 6010 30



Gordon Bachand - 2532 30



Tommy Priddy - 1282 15



Carlton Sisson - 1262 20



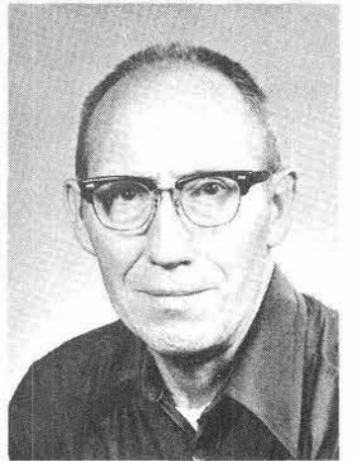
Dorothy Hall - 3530 15



Kenneth Jones - 9654 20



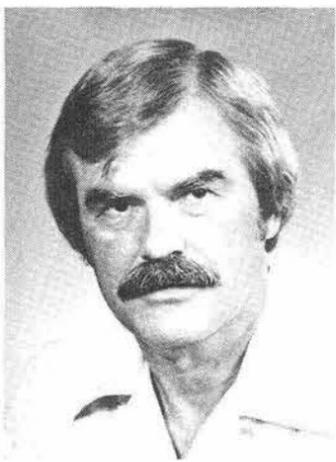
C. B. Stillwell - 4338 25



Buford Coleman - 3727 25



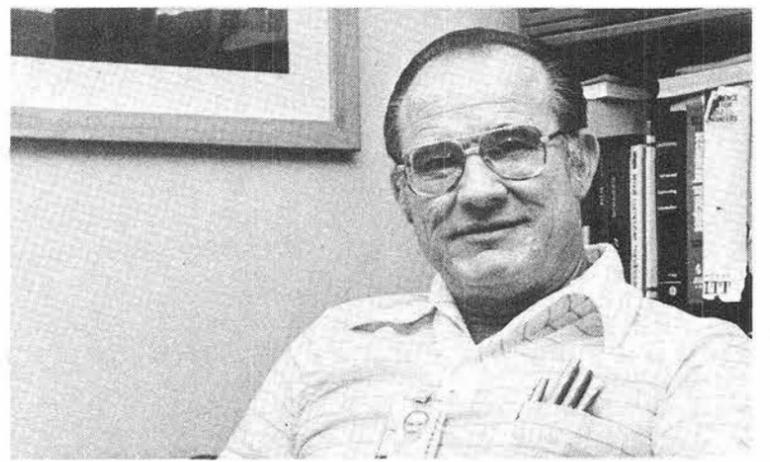
Allen Wilshusen - 2344 10



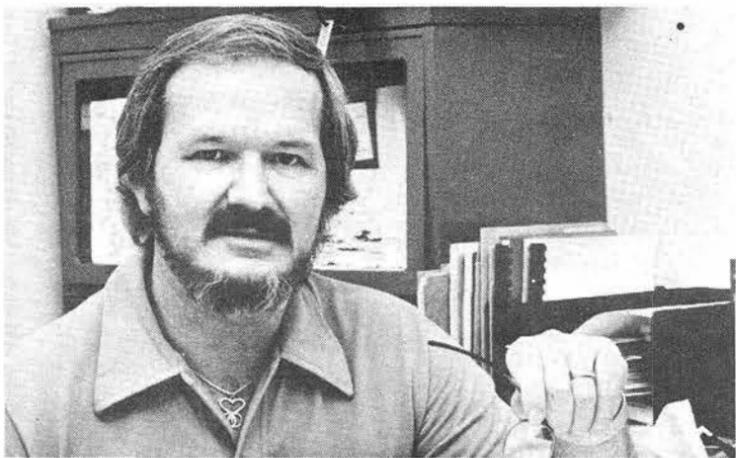
E. W. Kenderdine - 2328 20



Dave Overmire - 9485 15



B. G. Edwards - 1131 25



Leo Brady - 1131 20



Merrill Jones - 2551 30



Orrin Smith - 5216 25



Lawton Miller - 1323 20



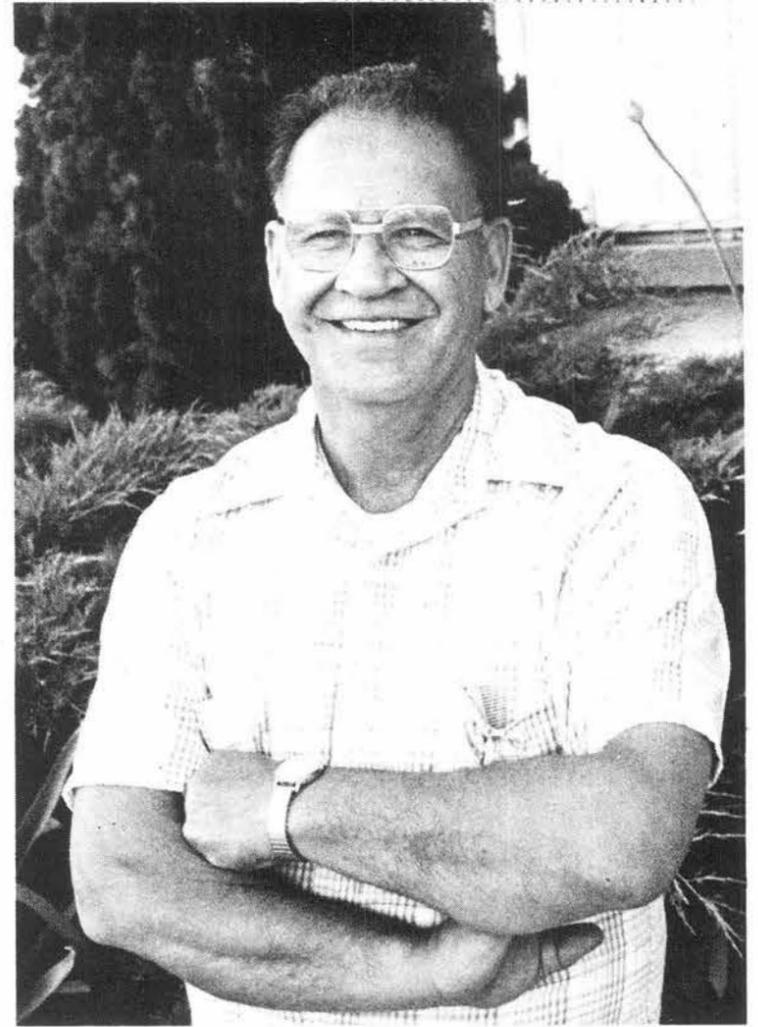
James Van Meter - 1172 20



Bob Courtney - 9572 15



Charles Dunn - 3423 20



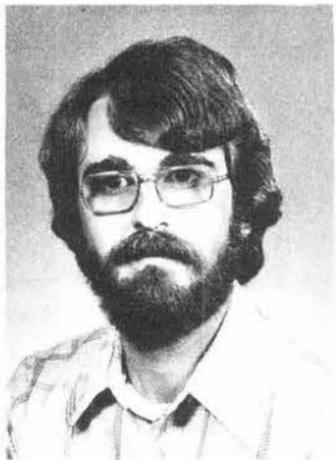
Mike Lovato - 8257 30



Howard Viney - 1130 30



Bob Jeffrey - 1731 25



Larry Jennings - 9621 10



William Crawford - 4322 20



John Mitchell - 1243 20



Ron Johnson - 1323 20



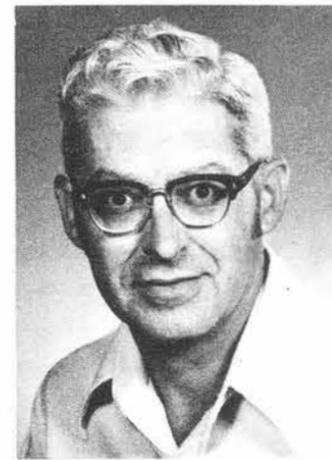
Stanley Booker - 2552 20



Dick Damerow - 2514 15



Karl Wiegandt - 9624 10



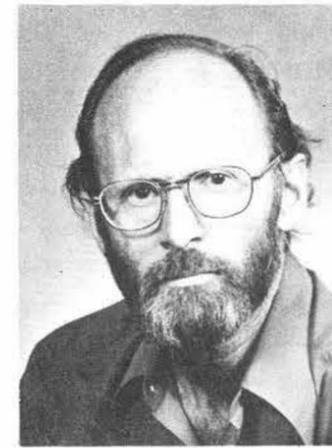
Donald Schreiner - 5114 20



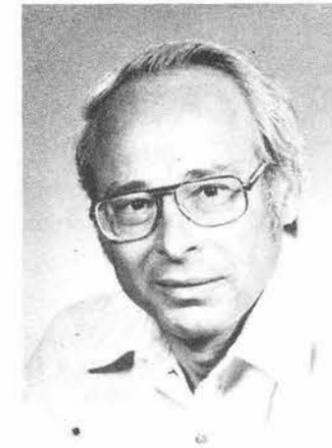
Adam Trujillo - 1135 25



Jerry Pierce - 3725 30



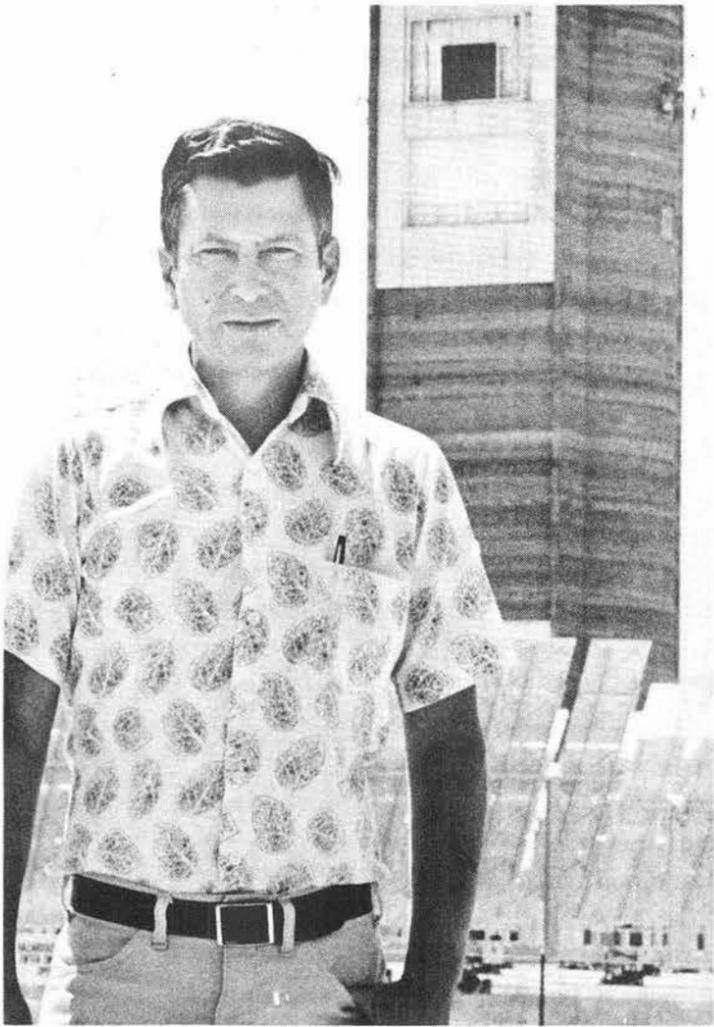
Eddy Jacobs - 2351 20



Tom Flanagan - 1115 20



Dave McVey - 1261 20



Bill Zagar - 9658

20



Dale Hill - 9656

20



Kenneth Grothaus - 2522

15



Craig Melville - 5214

10



Lloyd Alpaugh - 3151

20



Stuart Asselin - 5412

20



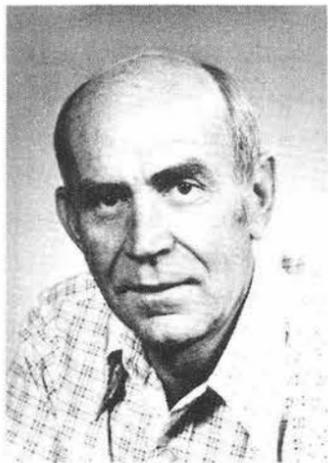
Alma Mischke - 3251

25



Ronald Hamilton - 3311

10



Lester Sandlin - 1757

20



Donald Holck - 2155

20



Dan Murphy - 9485

20



Chris Padilla - 9631

30



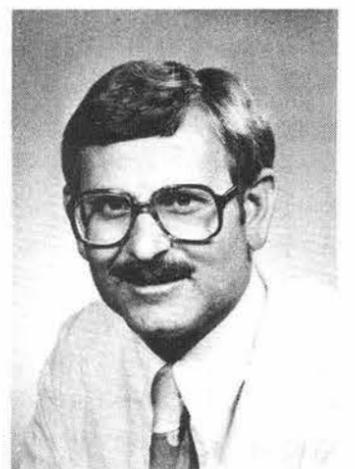
Danny Drummond - 5813

10



Kenneth Shirley - 9656

10



Wade Adkins - 9657

15



Ernie Sanchez - 3310

15



John Piper - 1323

30



C. A. Lowry - 2552

30



Dale Ruth - 9655

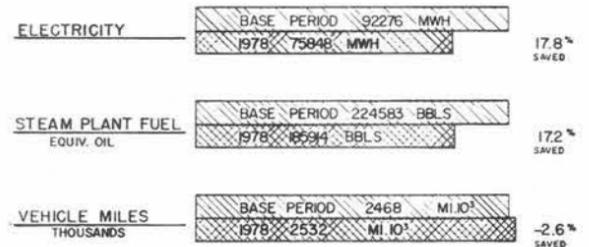
15

SANDIA IRRADIATOR for DRIED SEWER SLUDGE (SIDSS)—First shipment of cesium 137 to fuel pilot facility in Area III is lowered into pool of water in former SERF facility in Area V. Richard Stump (3312) and Jim Pierce (5335) preside. The 6000-lb. shipping cask encloses a 2 X 20-inch cylinder containing the cesium 137 pin. SIDSS construction should be complete in October. Fifteen of the pins, at 65 kilocuries each, will be installed in SIDSS to irradiate (and thereby sterilize) sewage sludge for use as a fertilizer or supplemental animal feed.



ENERGY SAVINGS

COMPARED WITH USAGE IN BASE PERIOD—JULY 1972 THRU JUNE 1973
CURRENT REPORTING PERIOD ENDING JUN '78



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

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (814/6).

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and ERDA employees.
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

TRASH BAGS, city approved, \$4/box, \$20/case of 6, South Hwy. 14 Project. LAB NEWS office, Bldg. 814.

SEARS, 15'x3' swimming pool w/filter & other extras, up & in use now, \$85. Davis, 294-0139.

SQUARE DANCE dresses, 2, sizes 12/13, 13/14; luggage, assorted sizes. Joseph, 268-5414.

TWO sections of metal shelving, each 3' wide, 7' high & 2' deep w/back & sides. Hunnicutt, 821-2405.

WALNUT end table, \$25; 2 National Bedding box springs, \$40 ea., 2 for \$75. Philbin, 292-1352.

PANASONIC 610 reel to reel tape recorder, 4-8 hrs. continuous music, \$200; 22/250 Winchester Model 70 rifle, new, \$175. Gonzales, 247-9406.

SOFA & CHAIR, brown tweed upholstery, early American style, \$95. Holmes, 292-0898.

US MAG WHEELS, 4" dia., 5-lug, fit small Chrysler products—Duster, Swinger, etc.—\$120/set. Rebarchik, 299-1385.

30" ROPER elect. range, coppertone, \$120. Gabaldon, 255-1929.

25" MAGNAVOX color TV, wood cabinet, \$150 or best offer; 36" desk, wood w/3 drawers, \$25. Garcia, 344-5410 or 256-7606.

GUITAR, 12-string Epiphone acoustic w/case, built-in pick-up w/volume control, \$90. Marquez, 344-4771 after 5.

METAL DESK, 54x24, \$95. Elliott, 294-1785.

CARDBOARD CARTONS for moving, wardrobes, dish packs, etc., used once, 1/2 price. Russell, 292-3279 after 6.

MEN'S tooled leather Big Horn show saddle, roughout seat, breast collar, double cinch, \$185. Stearns, 281-3872.

PEAVEY brain acoustic 106D w/two 15" JBLS Hofner bass, negotiate. Gleicher, 894-8777.

FREE IRIS plants to give away, assorted colors. Schroeder, 344-1011, 4101 Dietz Court, NW.

ENGLISH SETTER puppies, 8 wks. old, hunting background. McNeill, 293-1897.

SET OF FOUR 14" chrome reverse wheels & two 14" E.T. mags w/tires, will fit most G.M. products. Prevender, 299-5253.

COUCH, 8' velour flowered material, \$150, originally \$400, 2 yrs. old, matching love seat, \$50. Burns, 268-1306.

55MM FILTERS, Canon haze and Vivitar polarizing, new, never used, \$5 ea. Rosenberg, 881-7732.

WASTE DISPOSAL/sewage system, aerobic type, almost new. Kraft, 299-2157.

HQ-110 Ham Band receiver, 160 to 6 meters, Q-multiplier, X-tal calibrator, \$85. Mendel, 265-3840.

FOLDING pingpong table, regulation size, 4 paddles, net; 6' high V-mesh fencing, never used; 3' chain link fencing. Barth, 345-0172.

TENT TRAILER, alum. hard top, canvas sides, winch set-up, sleeps 4, dinette, water tank, spare tire, \$350. Benson, 296-4282.

ELECTRIC DRYER, \$35, it works. Rarrick, 296-2340.

TWO WATT three channel TRC-180 walkie talkie w/batteries & crystals, \$35 or best offer. Schreiner, 266-6020.

KENMORE sewing machine & table, \$100; matching green glass table lamp & swag lamp, \$50. Padrick, 299-7971.

SEARS elec. clothes dryer, white, 6.9CF capacity, 3 cycles, fabric selector, wrinkle guard, used 3 months, \$165. Boyes, 281-1171.

SEARS house water pump. Abeyta, 298-4276.

TRUMPET, Reynolds, mute, \$75; rug, 122 sq. yds., \$2/sq. yd.; dog house, \$20. Chavez, 298-1649.

SUPER 8 sound movie camera, GAF SS805, used 8 mos., \$125. Seager, 299-4137.

BUCILLA Persian yarn, many colors, 20 cents/10-yd. skein; Avon bottles, 75 cents to \$1.50. Gallegos, 299-5213.

WOODARD casual dining furniture: black wrought iron & blond wood, table, 4 chairs, buffet, serving cart, \$190. Nicovich, 299-1430.

KING SIZE BED, box springs, mattress, frame, Serta-Firm, 2 yrs. old, plus sheets. Neff, 904 Turner Dr. NE.

BIKING HELMET, MSR L-XL, \$20; propane lantern, \$8; propane stove, \$12; 2 Dacron sleeping bags, \$10 ea. Kohler, 821-1802.

9.50-16.5 10-PLY TIRES, 2 ea. 2000 miles, 4 ea. some tread; Chev. wheels, 4 ea. 8-hole, best offer. Cook, 869-6921.

EUROPEAN LENSES, pair orange turn section taillights for '68-71 VW Beetles, never used, \$25. Christenson, 292-1491.

GARAGE SALE: Aug. 4 & 5; tire machine, bubble balancer, oil dispenser, brake bleeder w/attachs., furniture, & more (3 families). Vleck, 13313 Mountainview NE.

CHAIN SAW, 16" Homelite w/case, new, \$135; inverters, DC to AC, 1000 watt, \$100; 5-spd. bike, boys 24", \$35. Sparks, 898-1252.

DISHWASHER, portable, \$90; Argus 35mm slide projector & slide cartridges, \$40; full-size headboard, footboard & frame, \$25. Mueller, 296-2973.

GE 19" B&W TV, wood grain cabinet, \$100; girl's 20" spyder bike, chrome fenders, racing type bars, \$40. Stuart, 265-7315.

LUGGAGE RACK, enclosed, adjustable to fit most cars, \$20; electronic ignition, Chev. 350, new, \$20. Westfall, 881-1184.

4" X 6" X 9' West Coast fir beams, 3 ea. available for \$18. Hernandez, 268-5000.

CONCRETE MIXER, Sears, 4 1/2 cu. ft. total capacity, \$195. Stephenson, 296-9330.

COUCH, \$40; movie screen, \$25. Falacy, 293-2517.

BUNDY trumpet, case & music stand, \$40; dinette set w/4 chairs, \$40. Gammon, 268-1032.

3-BURNER STOVE w/oven for RV, w/horizontal mount LP bottle, both for \$125; molding head cutter & blades for 10" Craftsman saw, \$20; lg. bird cage, \$10. Worrell, 299-0381.

MUNTZ 8-track stereo, speakers, AM-in-dash, fits Datsun, all \$55; canister vacuum, 5.6 amps, all accessories, \$65. VanDeusen, 299-4328.

VW BUG rear bumper w/guards, \$16; Chilton's 1949-71 VW repair manual, \$4. Horton, 298-4449.

TRANSPORTATION

'70 FORD VAN, bubble-top, aux. gas tank, holding tank, stove, sink, ice-box, porta-pottie, \$2000; trade for small compact as part payment. Yarbrough, 255-4087 or 294-0139.

'73 240-Z, fully loaded, low mileage, mags, Michelin radials, AC, \$4500 or best offer. Shay, 299-2634.

'76 MONTE CARLO Landau, silver gray, 21,000 miles, AT, PB, PS, AC, AM-FM, swivel bucket seats. McLaren, 299-1359.

KAWASAKI Enduros dirt/street: '74 100cc, \$295; '76 175cc, \$475; '73 Yamaha 175cc, \$295. Lassiter, 298-2461.

'78 GMC 1/2-ton, AC, camper shell, in warranty, cost over \$6200 in Jan., less than '77 book \$4995. Floyd, 292-2160.

'75 MINT 400 Penton dirt bike, approx. 75 hrs. use, \$1000; Comet 3-rail trailer, lights & plates, \$150. Holmes, 293-6851.

'77 DODGE 1-ton D300 Adventurer SE camper special, PS, PB, \$5700 or best offer. Jensen, 266-0849.

'74 PINTO wgn., big engine, 4-spd., AC, 53,000 miles, one owner, \$2100. Castillo, 296-5798 after 7.

'71 TRAVELALL 1010, 392 V8, AC, PS, PB, SB radials, dual tanks, tow pkg., \$1400. Kinoshita, 299-6491.

'71 FORD Custom, 4-dr., V8, AC, AT, R&H, PS, PB, vinyl top, new paint, \$600. Moody, 281-3466.

'66 FORD pickup, 6-cyl., 84K mi, open bed. Vittitoe, 299-9298.

KAWASAKI KZ-200, 8 mos. old, \$494. Peet, 294-1250.

'73 PONTIAC GTO, PS, PB, AT, AC, rebuilt engine, \$2000. Prevender, 299-5253.

'77 TOYOTA Celica GT lift back, AC, AM-FM stereo radio, 5-spd., yellow. Baca, 298-4212.

'77 DELUXE VW pop-up camper, under warranty, 14,000 miles, fully equipped, including AC, CB, \$8500. Lindell, 296-1841.

'66 F-250 FORD pickup w/11' camper, \$1750. Kramm, 281-5379.

'77 400cc HONDA Super Sport, full dress, \$1200. Jaramillo, 864-8379.

'73 OLDS Vista Cruiser, PS, PB, AC, 350 engine, moonroof, luggage rack, steel radials, below book. Hughes, 255-4628.

'76 DATSUN B-210, green, \$3075 or best offer. Johns, 256-0809.

'71 FIAT Spyder conv., 40,000 miles, recent overhaul, new white paint, \$950. Rarrick, 296-2340.

'76 GLASTON GT-150, 85 HP Johnson, power trim & tilt, full cover, 2 6-gal. tanks, 2 stainless steel teflon props. Neff, 904 Turner Dr. NE.

'71 MERCURY Marquis Brougham, fully equipped, \$1250. McIlroy, 8907 Los Arboles NE, 299-4977.

'73 VEGA Hatchback, 4-spd., air, radials, new battery, \$695. Watterberg, 294-6759.

'72 MAZDA RX-2, 2-dr., 60K miles, air, alloy wheels, \$900. Seager, 299-4137.

'65 CHEVELLE Malibu SS, 327 cu 350 HP V8, 4-spd., make offer. Plummer, 296-4327.

WILL SELL ONE: '71 VW, fuel injection, stereo, many other options installed, \$1250; '64 Karmann Ghia, \$650. Sparks, 898-1252.

'74 DATSUN B-210 Hatchback, 80,000 miles, maintained, \$1800, \$300 under book. Stauffer, 281-5271.

'67 MG 1100 4-dr. sedan, front wheel drive, radials, near new battery. Westfall, 881-1184.

'69 SUPERBEE, 383 magnum, automatic, new wire wheels, radials, AM-FM cassette, burgundy & white, \$1500 or best offer. Martinez, 298-7819.

10-SPD. BICYCLE, Moto Becane Mirage, rid'gen 3 mos., 23" frame, 27" Michelin tires, Suntour derailleurs, alloy hubs-crankset & stem. Lagasse, 299-8357.

FOR RENT

LAKE FRONT CABIN, Vallecito Lake near Durango, avail. day/week, deluxe, 3-bdr., w/fp, fully furnished, reservations. Croll, 881-7235.

NEW 2-bdr. 4-plex, near schools & base, all appliances, laundry facilities, carpet, drapes, Skyline & Figueroa. Hill, 299-7813 after 5 weekdays.

CABIN in Taos Mts. on Hondo River, deluxe accommodations, sleeps 8, fully equipped. Peet, 294-1250.

NE LOCATION, 3-bdr., 1 1/2 baths, garage, corner lot, unfurnished, avail. Sept. 1. Cyrus, 898-4038.

2-BDR. HOUSE, walled yard, near base, SE location, avail. Aug. 20, \$250, see at 800 Valencia SE. Chavez, 865-3933.

3-BDR. BRICK, 1 1/2 baths, den, big screened porch, just north of Coronado Center, \$365. Gallagher, 821-7452.

WANTED

MOBILE HOME; windmill; A.C. motor generator set. Kane, 881-7672.

NEW OR USED gas & elec. refrig. for RV. Karver, 873-0653.

TRADE Guild classical Guitar, Lab-80 record player, Karlson 15" enclosure speaker for exceptional view camera equipment. Eyer, 299-4580.

ACS Monograph: "Hydrogen Peroxide," by Walter C. Schumb, Charles N. Satterfield & Ralph L. Wentworth; Reinhold, 1955. Servis, 865-7629.

CHEST FREEZER, not working. Gleicher, 294-8777.

15X or higher telescope w/adaptor TL or Barlow, for SLR Rolleiflex SL26 camera. Roberts, 255-9527.

CANOE. Shunmy, 265-1620.

NON-WORKING clarinet, trumpet, flute or horn. Smathers, 298-0613.

WATER SKIS for children. Falacy, 293-2517.

LOST AND FOUND

LOST: Coleman 2-gal. water jug, white/green, left at Bullhead 2 softball field, July 3 while playing w/Sandia softball teams. Nogales, 247-1178.

LOST—Ladies' small silver cigarette lighter, 2 brass keys & 1 lg. silver key on ring, 5 keys on "Galles" pewter disc.

FOUND—Papermate pen, Ladies' 10-yr. Sandia brooch, brown-rim Rx glasses in brown case, ladies' 2-tone Rx glasses. LOST AND FOUND, Bldg. 832, 264-1657.

REAL ESTATE

3-6 BDR., full basement, 2 1/2 baths, wet bar, mature trees, \$23/sq. ft., 2408 sq. ft., Menaul/Juan Tabo, \$54,950. Asprey, 296-6673.

3-BDR. 1 1/2-yr.-old home, 1 1/2 baths, all brick, prof. landscaping, refrig. AC, Academy Hills. Moshenrose, 821-2440.

Smoothie Tonight, 'Prince' Tomorrow

TONIGHT'S HAPPY HOUR buffet features sauerbraten, hot German potato salad, sweet and sour cabbage and other goodies. A group called Smoothie plays for dancing from 6:30-10:30. Next Friday's Happy Hour (Aug. 11) finds an all-girl band called Blue Velvet wired into the bandstand, coq au vin on the buffet menu.

ALSO TONIGHT, singles are mingling down at the Annex pool with swimming and dancing. The group repeats the party on Tuesday, Aug. 15. Singles are also planning a travel package to Las Vegas in late fall. Start saving your shekles now.

TOMORROW at Variety Night, the Miguel Caro folklorico dancers entertain starting at 7. The movie is "The Prince and the Pauper," a Hollywood adaptation of the Mark Twain classic. Super sandwiches are available starting at 6 p.m. Admission is free to members and families.

TEENAGERS should enjoy disco dances on Aug. 10 and 24 from 8 to 11 p.m. Door prizes and dance contests are part of the fun. Member parents must pick up tickets at the Club office for their youngsters.

TICKET DEADLINE for the Aug. 19 Shrimp Peel is Saturday, Aug. 12. Get yours early. The event features plenty of shrimp, clam chowder, green chili and other goodies. Entertainment that evening includes a disco demonstration by Renee Velasquez and the big trumpet sounds of Freddie and the Mellotones, one of the best woodshedded groups in the city. Member tickets are \$6.50, guests \$7.50 and they're available at the Club office.



SINGLES MINGLE TONIGHT starts at 4:30 at the Annex pool. Swimming, dancing and refreshments are part of the party. Committee people and friends inviting you to join the fun are Dave Powers (1334), Sandi Hammerstran (Szabo), Mary Benson (C-Club lifeguard), Hazlet Edmonds (3511) and John Campbell (3172).

TRAVEL—The Disneyland package has a change—instead of four nights, it's now three—start Oct. 25, return Oct. 28 and the price is now \$190 (dbl.). The package includes air fare, hotel, 15-ride book to Disneyland, a tour of Universal Studios and a boat trip to Catalina Island.

Other trips still open are Mazatlan—seven nights starting Oct. 28 at the Hotel Playa Mazatlan (signups close Aug. 21) for \$275 (dbl).—and Cancun—seven

nights starting Sept. 9 at the Hotel Cancun Caribe for \$366 (dbl.). Also, discount fares are available for excursions on the Cumbres and Toltec Railroad on Aug. 26 and Oct. 14.

Call the Club office (265-6791) for more info or see Travel Director Ed Neidel in the Club lobby tonight between 6 and 7.

UPCOMING EVENTS—C-Club retiree party Aug. 18; Disco Soul Session Aug. 26.



JAK STRASCINA (9572) & SARAH McHAFFIE (daughter of Barbara McHaffie) think you should join them for the Coronado Ski Club's Ski Fair on Aug. 15, designed to induce those who aren't members to sign up and to provide fun and games for all: swimming, games, movies, music, and free refreshments. Bring a picnic lunch. Trips, discounts, lessons, repairs, equipment, ski exercises and the RMSA will be discussed, and a "super door prize" will be awarded. Things will start rolling at 4:30, right after work.